Gleanings in Bee Culture

Established 1873

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October, 1940

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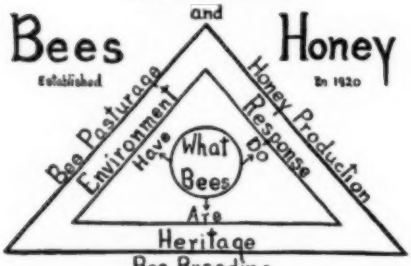

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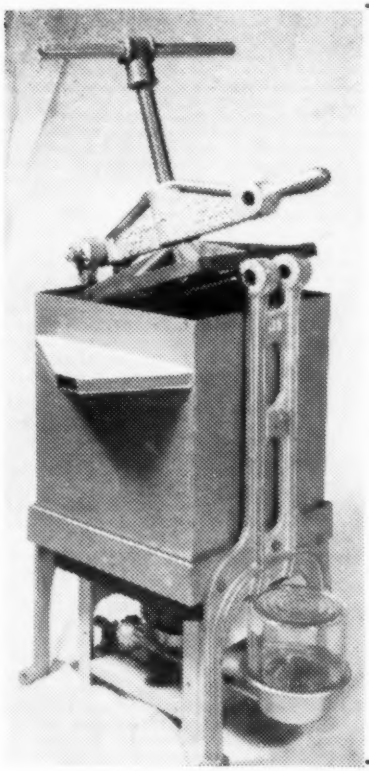

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The Monthly Honey Market

U. S. GOVERNMENT REPORT

Information from Producing Areas (last half of August).

California Points: Southern California.—Temperatures have been normal to slightly above, and in the interior it was very warm. No precipitation occurred. Colony condition is normal, with bees active only in occasional favored localities, in sweet-clover, alfalfa or lima bean areas. It is especially dry in the hills, but blue curl, turkey mullein, off-bloom orange, wild buckwheat and occasionally other plants are furnishing some honey. Tamarisk is doing well in the desert. Honeydew is reported in a few places in the mountains. Brood-rearing seems to be light. But many beekeepers secured a good crop of Sage honey. Forest fires have burned over many acres of nectar-producing plants. The crop from wild buckwheat has been very disappointing and may not average over 10 pounds to the colony for Buckwheat alone. Demand for honey has been moderate to slow, with weaker tendency, especially on the darker grades of honey. Trading is reported slower than during any period of the last several months. Sales by beekeepers in ton lots or more at Southern California delivery points, per lb.—Orange, Water White 4¾-5¼c, Extra White 4½-4¾c, White 4¼-4½; Sage, Water White 5-5½c, Extra White 4¾-5c, White 4¼-4½; Sage-Buckwheat, Extra Light Amber 3 5/6-4¼c, Light Amber 3¾-4c. Sales f.o.b. country points—Light Amber to Extra Light Amber Alfalfa, Blythe area $4.00-4.10 per case of 120 pounds. The beeswax market has been weaker, with dealers offering beekeepers 16-18c per lb. delivered Los Angeles.

Imperial Valley.—Sales reported Light Amber to Extra Light Amber Alfalfa $4.15-4.20 per case of 120 pounds, f.o.b. shipping points. The market shows a weaker tendency.

Central California.—Temperatures were slightly below normal in the interior valley, with coastal areas slightly above normal during the first part of the period and about normal during the latter part. No precipitation reported except scattered thunder showers in the mountain areas. Bees are actively gathering nectar from cotton, alfalfa, beans, Ladino clover, and other sources. The cotton flow was never heavy, but the honey is of good quality. Good yields are reported from spikeweed, which is being extracted along with Cotton honey. Blue curl plants are plentiful, and blue curl and jack clover are beginning to yield, with indications of a good crop. A better-than-average yield is reported from alfalfa, which is now about through blooming. Bees are reported in good condition. The market has remained quiet, with little honey reported moving, though beekeepers have been offering freely. Prices have held fairly steady. Sales by beekeepers in ton lots or more, per lb., delivered Bay Cities—Cotton-Alfalfa, Light Amber 3½-3¾c; Extra Light Amber Bean 3¾-4c; Extra White to Water White Sage 5½-6c; Light Amber Mixed Flowers 3½-3¾c; delivered interior valley points—Extra Light Amber Sage-Buckwheat 3c; Light Amber Mixed Flowers 2½c; Extra Light Amber Cotton-Alfalfa, cans returned 2½-3c. Sales delivered Southern California points—Light Amber Buckwheat-Sage 4c.

Northern California. — Temperatures ranged below normal, with interior valleys experiencing relatively few periods of warm weather. Morning fogs were general along the coast. Precipitation was confined to scattered thunderstorms in mountain areas. Star thistle continues to yield heavily and a large crop from this source appears in prospect. Alfalfa has also yielded well, and spikeweed and tarweed are in excellent condition for a continued nectar flow after the thistle flow ends in early September. The market has been only moderately active with sales confined largely to Thistle honey. Beekeepers have offered freely, but little honey has changed hands. The market has been fairly steady. Sales reported by beekeepers in ton lots or more, delivered Bay Cities, per lb.—Thistle, Extra Light Amber 4-4¼c, Light Amber 3½-3¾c; Light Amber Mixed Flowers mostly 3½c; sales delivered interior valley points—Thistle and Mixed Flowers, White 3½c, Extra Light Amber 3¼c, Light Amber 3c; Thistle, Extra Light Amber 3½-3¾c, Light Amber 3¼-3½c; Extra Light Amber Thistle—Lima Bean 3½c; Mixed Amber 2½-3c.

The market for beeswax has been quiet, with very few sales reported. Good yellow wax has brought 19-20c per lb. delivered Bay Cities; other sales 19c per lb. at interior valley points.

Pacific Northwest: West of Cascades.—Toward the close of the period light showers fell in the northwestern part of Oregon, and several showers in Washington, aiding nectar-bearing plants. Brood-rearing is progressing satisfactorily in both valley and mountain areas. Fireweed bloom is about over and in Western Washington bees are working on pearly everlasting, which will damage the flavor and color of Fireweed in yards that have not been extracted. The retail sale of honey has improved recently, but large lot sales of honey have so far been slow with dealers waiting to buy until the market becomes more stabilized. Occasional sales reported Fireweed, White 5½c, Light Amber 5c per lb.; delivered Seattle; Extra Light Amber to White Fireweed 5c per lb. delivered Portland; Light Amber to White Clover-Vetch 4-4½c lb. delivered Portland. Demand for beeswax has been moderate, with dealers paying 20c per lb. in trade. Small lot sales small pails, White Fireweed 9c; 60s Amber Vine Maple 7c; small pails Light Amber Vetch 7½c.

East of Cascades.—Second-cutting alfalfa is over, and third-cutting alfalfa is now yielding, with bees in some sections gathering considerable honey. Though some beekeepers report a short crop, others have obtained one of the best crops in years and many beekeepers have obtained 100 pounds or more from sweet-clover and alfalfa. The market has been slow, with White Sweet-clover-Alfalfa reported selling at 4-4½c per lb., some 5c, at shipping point; other offers 4-4½c per lb. delivered Portland; small pails 6-6½c per lb., f.o.b.

SUMMARY—Temperatures during the past two weeks have been generally above normal in the West and have varied in the East from substantially above normal to appreciably below normal. Precipitation has been spotted to heavy over parts of the eastern, central, and southern portions of the country, but the West has continued dry. Cool, rainy weather has interfered with bees gathering the late flow over

much of the East, but has increased prospects for a crop of honey from goldenrod and asters. Bees are in better condition than usual for this season of the year, and as brood-rearing has continued to a greater extent than usual colonies should enter winter rather strong in bees. The irregular nature of this year's crop of honey continues to be emphasized in the late reports. Much depends upon the extent to which winter and spring losses of bees were replaced in the White Clover Belt but in addition, throughout this area producing sections only a few miles apart show widely varying yields of honey. Had the number of strong colonies at the beginning of the main nectar flow been up to normal it is possible that a crop equal to that of 1938 might have been secured. As it is, reports so far received make it questionable whether the crop is much larger than it was last year in spite of the larger production in Northern and Central California and the occasional heavy yields throughout the White Clover and Sweet-clover areas. Available data are too indefinite to hazard any estimate as to the production of honey.

The market for honey is also irregular. Demand for new crop honey is increasing generally, with inquiries being made by many large buyers. In spite of the lack of carry-over into the new season, market levels do not show much change from those of last year, a condition that has been aided by the sale of many distress lots of honey at low prices. Price ranges are wide for what is apparently the same quality of honey and in the same area; and sales of honey in small containers show an even wider range than honey in 60s. The color of the honey produced in the East this year is unusually White and it is of heavy body, but in the Mountain States the color was often darker than usual, and relatively little of the honey in the Mountain States is expected to grade lighter than White. Comb honey is extremely scarce this season and varies rather widely in quality. Beeswax in the West has sagged slightly in price during recent weeks.

Monthly Report of Honey Producers

Early in September we sent the following questions to honey producers: 1. What is the final average yield per colony to date this season in your locality of (a) Extracted honey? (b) comb honey? Give answer in pounds. 2. How does this compare with the average yield for your locality? Give answer in per cent. 3. At what price has honey been sold or contracted for, if any, in large lots (carload or less) in your locality, during the past month, for (a) extracted honey per pound? (b) comb honey, fancy and No. 1, per case? 4. What are prices when sold to grocers in case lots of (a) extracted honey in 5-lb. pails, or other retail packages in terms of 5-lb. pails? (b) comb honey, fancy and No. 1, per case? 5. What is the retail price to consumers in your locality for (a) extracted honey in 5-lb. pails, or other retail packages in terms of 5-lb. pails? (b) comb honey, fancy and No. 1, per section? 6. How is honey now moving on the market in your locality? Give answer in one word, as slow, fair, or rapid. 7. What is the condition of the colonies for winter in your locality compared with normal, considering the number and age of bees and the supply of stores? Give answer in per cent. The answers received are tabulated as follows:

		1.		2.	3.		4.		5.		6.	7.
		Aver. yield.		Com- par-	Large lots.		To grocers.		To consumers.		Move-	Cond. of
Sept. date	State. Name.	Ex.	Comb.	ison.	Ex.	Comb.	Ex.	Comb.	Ex.	Comb.	ment.	colo.
17	B. C. (A. W. Finlay)	60		110	.09½		.65		.85		Fair	
17	S-Ala. (J. C. Dickman)	40	25	100			.40		.48		Slow	60
12	S-Calif. (L. L. Andrews)	25	0	100					.50	.18	Slow	75
9	SE-Colo. (O. E. Adcock)	75		150	.04	2.40	.40	3.25	.50	.18	Slow	100
10	S-Fla. (C. C. Cook)	50		100	.04		.35		.50		Slower	100
12	C-Fla. (Harry Hewitt)	35		75			.50		.65		Slow	100
9	SE-Ga. (J. J. Wilder)	82		110	.05½		.45		.55		Fair	100
10	NC-Ills. (A. L. Kildow)	60	0	50					.50			100
12	S-Ills. (Carl E. Killion)	145	120	110	.05½	3.13	.45	3.30	.69	.19	Fair	125
9	NC-Ind. (T. C. Johnson)	75	60	100			.50	3.00	.60	.18	Fair	100
6	NW-Ind. (E. S. Miller)	45	25	80			.50	3.00	.65	.15	Slow	
10	W-Iowa (E. G. Brown)	100		60	.04¼				.50		Fair	100
11	C-Md. (S. G. Crocker)	25	20	100			.60	4.00	.75	.20	Slow	90
10	C-Mich. (E. D. Townsend)	60		60	.05½						Fair	100
17	S-Mich. (Floyd Markham)	80		75			.40	3.00	.65	.20	Fair	100
13	E-Minn. (Floyd W. Ray)	60		50	.05		.37		.45		Fair	100
11	W-Minn. (B. L. Morehouse)	118		90	.05⅜		.42		.55		Fair	100
13	C-Nebr. (J. H. Wagner)	60		33			.35	3.00	.41	.17	Slow	100
13	W-Nev. (Mrs. E. G. Norton)	80		90							Slow	100
13	W-Nev. (Geo. G. Schweis)	60	30	50	.05	2.75	.45	3.00	.60	.20	Slow	100
10	W-N. M. (C. A. Baltzley)	100		110	.06				.65	.23	Fair	100
12	NW-N. Y. (Geo. B. Howe)	60		75	.06½	3.60	.50	3.80	.65	.20	Fair	100
9	C-N. Y. (F. W. Lesser)	90		100	.06½	3.00					Rapid	100
9	E-N. D. (M. W. Cousineau)				.05				.45		Rapid	50
13	C-Ohio (R. D. Hiatt)	115	55	100		2.50	.48	3.50	.60	.19	Fair	100
13	NC-Okla. (C. F. Stiles)	40		100			.45		.65	.18	Fair	100
10	C-Penn. (Harry Beaver)	25		25			.50	3.00	.60	.17	Slow	80
9	SE-Penn. (D. C. Gilham)	10	4	10			.70	4.25	1.00	.25	Slow	75
9	W-S. C. (E. S. Prevost)	30	25				.18		.20		Fair	90
16	SE-S. D. (J. F. Norgren)	75	60	80	.05			2.50	.53	.13	Slow	100
12	C-Texas (T. A. Bowden)	50		100			.45		.55		Slow	100
11	S-Texas (H. B. Parks)	38		86	.05		.45		.50		Fair	88
16	N-Utah (W. H. Hendricks)	40		100			.40		.45		Fair	100
16	S-Va. (T. C. Asher)	40	30	85			.45	3.60	.53	.20	Fair	90
11	N-W. Va. (W. C. Griffith)	5	0	20					.45			50
9	SE-Wisc. (N. E. France)	100	24	110	.04	2.40	.40	2.50	.45	.15	Fair	100

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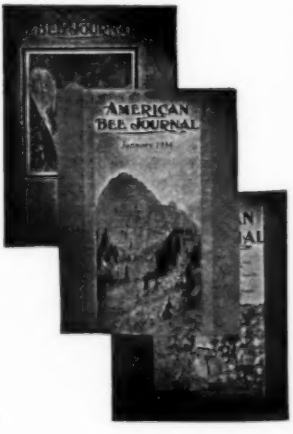

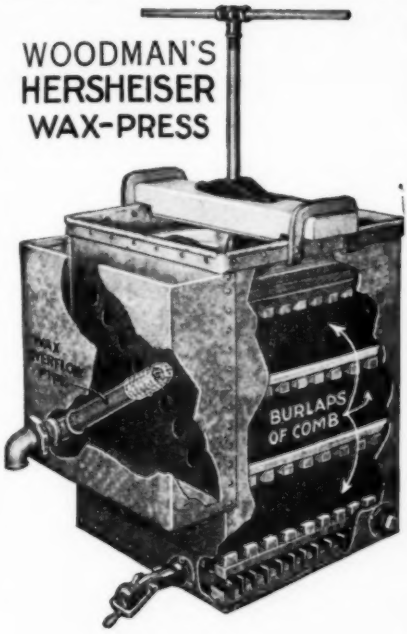

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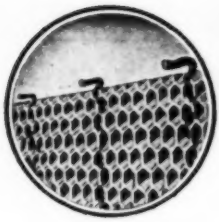

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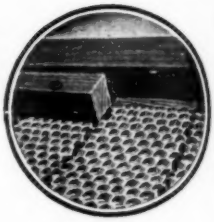
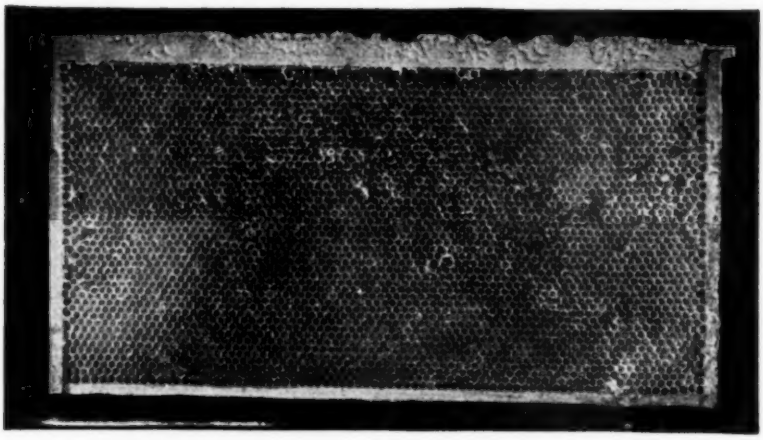
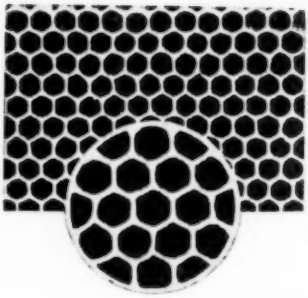




That Do So Much



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Gleanings
in Bee Culture

October
1940

Wintering vs. Package Bees

By J. A. Munro
Entomologist, North Dakota Experiment Station

[Note.—This paper was prepared for the Bi-monthly Bulletin issued by the North Dakota Agricultural College, Experiment Station.—Editor.]

At the approach of cold weather in the fall when the hive temperatures lower to a point where brood-rearing is discontinued, the colony makes special preparation to protect itself from the cold. When the temperature of the hive reaches 57° F., as has been shown by Phillips and Demuth[1], the bees assemble from all parts of the hive to form a more or less spherical-shaped cluster and remain in this formation as long as the surrounding temperature is at this point or lower. The cluster is composed of thousands of bees whose activity, during the wintering period, is regulated largely by the surrounding temperatures. The bees on the outer surface exchange places with the bees within the cluster, and serve as a constantly changing insulation wall. The activity and honey consumption by the bees increase in rate as the temperatures surrounding the cluster decrease until such a point is reached where the bees become exhausted and die from the cold. This explains to a large extent the necessity of protecting colonies so that they may winter over with the minimum expenditure of energy and consumption of stores. It is known that excessive expenditure of energy by bees shortens their lives and results in a condition commonly referred to as "bad wintering". Sweet clover honey, which is the predominating type of honey produced in this area is a satisfactory honey for the winter use of bees.

Second Hive Body Benefits Outdoor-wintered Bees

Ordinarily there is enough honey stored in one standard depth hive body for the over-wintering needs of a cellar-wintering colony, but it has been demonstrated that for this area an additional hive body containing stores must be provided for satisfactory out-of-door wintering. The second hive body, besides supplying additional stores, provides a protected passageway between the upper and lower hive bodies when surrounding temperatures are too low for other movement of the bees.

Observations conducted at this station on colonies wintered out-of-doors in protected two-story hives have shown an average winter survival rate of slightly better than 90% as compared with about 60% for colonies in similarly protected single-story hives. The heavier winter mortality in the single-story hives was probably due to the inability of the bees to pass through the cold zone around the edges of the combs to needed honey stores. Usually the dead colony was found to have ample honey stores but was separated by barriers consisting of combs whose sides adjoining the dead colony were devoid of honey. Such a situation was not apparent in the two-story colonies because the bees could

[1]Phillips, E. F. and G. S. Demuth, The Temperature of the Honeybee Cluster in Winter. Bul. 93, U. S. Dept. Agric., 16 pp., 1914.

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readily pass between the combs of the upper and lower hive bodies to needed stores during the coldest portion of the winter.

For cellar wintering the single hive colonies wintered through on slightly less honey, were easier to carry and occupied less storage space than the colonies in two-story hives. The cellar-wintered colonies have shown the highest rate of winter survival with the average being 96%.

Cellar-wintering Bees Eat Less Honey

Studies conducted at the North Dakota Experiment Station indicate that in addition to having a higher survival rate, colonies of bees wintered in a good cellar consume less honey than well protected colonies wintered out-of-doors. A practical check on the stores consumed was made by weighing eight or more hives of each group at the beginning and end of each of three successive cellar-wintering periods. The difference between the two weighings represented the approximate amount of honey consumed. The periods extended from about the middle of November to the latter part of the following March. For the cellar-wintered group the average per colony consumption of stores was 14 pounds, while for the protected hives wintered out-of-doors the average was 29 pounds.

For several weeks prior to the beginning of the cellar-wintering period and for a time after the hives are moved out-of-doors in the spring, there is an additional amount of honey stores used which should be considered in computing the total amount required for carrying a colony through from the time the nectar sources cease in early fall until they are again available to the bees in the spring.

While this extra amount will vary from year to year, depending upon the sources available and weather affecting nectar gathering by the bees, it will probably average about 20 pounds of honey. Added to the losses occasioned during the actual cellar period this indicates that 34 pounds of honey is required for the entire wintering period of a cellar-wintered colony and 49 pounds of honey for an outdoor-wintered colony. Examination of the colonies during April revealed more brood in the hives which had been wintered outdoors, but as the season advanced towards the main nectar flow beginning in late June both groups reached practically the same level of colony populations and gave fairly similar returns in honey production.

The wintering of bees in a cellar differs from that of wintering them in protected hives out-of-doors largely in the manner of protecting them from the cold. For the cellar-wintered colonies, the protection is furnished by the cellar walls, while for outdoor wintering the protection consists of locating the beeyard in the shelter of a windbreak of trees and covering each hive with insulation material. The protection afforded by a good cellar is of a more uniform character.

Roof of bee cellar of Mr. E. H. A. Fischer, Grand Forks, N. D.

As an indication of the uniform and constant protection afforded cellar-wintering colonies, thermographic records for the wintering periods showed that for most of the time the cellar temperatures ranged from 41° F. to 44° F. Towards the latter part of the periods the cellar temperatures usually increased a few points but seldom above 49° F. prior to moving the hives out to their spring locations. On the other hand, outdoor wintered hives, although individually protected, were exposed to extremes of temperatures ranging from about 30° F. below zero in the coldest weather to upwards of 65° F. towards the end of the wintering period.

An Alternative for Wintering

During the past decade or more of years some beekeepers have avoided the wintering problem by destroying their colonies in the fall and restocking the hives with package bees in the spring. The practice would appear to be justified only where colonies are inadequately provisioned with honey stores in the fall or where it is not possible to provide satisfactory wintering quarters. Such colonies would fail to survive the winter and might better be destroyed in the fall.

Destruction of these colonies in the fall should not be done until the brood has emerged from the combs, otherwise cells will be clogged with dead brood. Usually, however, the combs are sufficiently free of brood by the middle of October that the small amount remaining is of little concern.

From the middle of October until the cellar-wintering period begins and from the time a colony is moved out of the cellar until late April or early May, which would be the ideal time for establishing package colonies, the average colony would prob-

408 colonies, 100 additional nuclei to bring back in the spring from Texas to North Dakota, by R. D. Jenkins.

ably consume about 10 pounds of honey. By adding this to the amounts previously mentioned as required for the cellar-wintering period, it will be seen that the saving in honey by destroying the colonies in the fall will vary from 24 pounds of honey per colony if computed on the cellar-wintering basis to 39 pounds of honey when computed on the outdoor wintering basis.

It is the claim of many beekeepers in this area that it costs the producers at least 1c per pound to remove the honey from the hive, extract it and put it up in 60-pound tins such as used for shipping to dealers and bottlers.

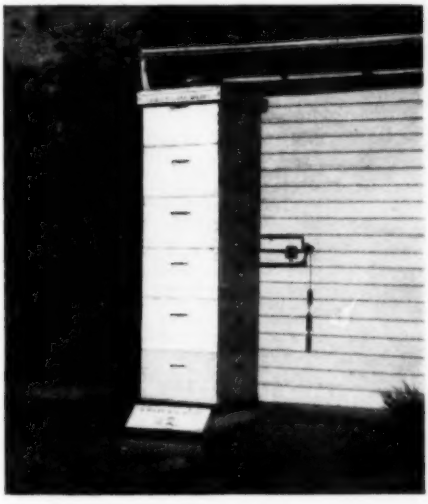
The price which local producers have received from dealers for carlot quantities of honey in 60-pound containers has of late been 5c per pound. Deducting the 1c per pound cost involved in removing the honey from the hives and placing it in containers, the returns on the honey salvaged from the colonies destroyed in the fall would amount to 96c if computed on the cellar-wintering basis or $1.56 if computed on the outdoor-wintering basis.

There are several sizes of packages on the market but the predominating size used for restocking hives is the 2-pound package, with a queen. This size of package contains close to 10,000 bees. The packages are obtained from dealers in southern states and cost the buyer about $2.25 each including expressage. Of late years there has been practically no difficulty in securing package bees when wanted. The packages usually arrive in good condition following their two or three days' train journey from point of shipment. Most beekeepers like to handle package bees because of their uniformity and convenience to handle. One possible advantage of package colonies, for beekeepers who make a practice of requeening their hives yearly, is that the package colonies are headed by young queens and, if the queens are of good stock, this obviates the necessity for requeening.

It has been demonstrated in our experiments that package bees, if installed in their hives in late April or early May will compare favorably in honey production with normal over-wintered colonies. If secured much later the 2-pound size package colony does not have time to build up to proper strength to make most satisfactory gains from the main honey flow which begins in the latter part of June.

On the basis of the prevailing price of honey and cost of package bees mentioned above, it is apparent that the beekeeper stands to lose from

Hive of bees on scales at North Dakota Experiment Station Apiary.



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69c to $1.29 per colony through the practice of destroying the bees in the fall instead of wintering them over.

There are difficulties met in the wintering-over of colonies as well as in the use of package bees, but it is felt that they are about of equal importance. For wintering, there is the usual loss of colonies from starvation, poor stores, and exposure to cold; while for package colonies there is the problem of loss through poor queens and supersedure of queens.

The cost of providing shelter for over-wintering colonies will vary to some extent with the method employed but will be offset to a large extent by the need for providing storage for the empty equipment if colonies are destroyed in the fall. Reviewing the situation briefly, it would appear that destruction of the colonies in the fall is justified only when it is not possible to provide satisfactory wintering conditions for the bees.

Recent Visitors at Medina

Dr. H. A. Scullen, entomologist at Oregon Apicultural College, Corvallis, is the guiding star of beekeeping in the Great Northwest comprising the territory north, south, and east of Portland. He has some two dozen classes on various subjects connected with his department, keeping him busy both winter and summer. He is doing special work this summer on the damage thrips do to sweet clover.

His class in beekeeping was one of the most responsive to a little talk we gave them nearly a year ago at Portland. They were interested because at the close they began to ask questions.

Dr. E. F. Phillips, formerly head of bee investigation work in the Bureau of Entomology, Washington, D. C., and now Professor of Bee Culture at Cornell University, Ithaca, N. Y., was another recent visitor at Medina. He needs no introduction to our readers. His name and opinions on scientific bee culture are scattered all through recent editions of our A B C and X Y Z of Bee Culture. He is now at work on the morale of a colony. Something interesting will come from this. Probably no name in all scientific beedom is better known than his.

A Case History in European Foulbrood

By Lee H. Watkins

When Sherlock Holmes retired from active detective work to his bee farm in Sussex, Mr. Doyle does not tell us whether the famous sleuth directed his master mind toward the solution of some of the many unsolved problems that confront the apiculturists of today. Perhaps, of all the questions pertaining to apiculture, the mystery of European foulbrood, with its many unsolved aspects, would have appealed most to his analytical mind. This disease has been with the beekeepers a long time, and in certain areas is still a very serious menace to successful beekeeping. Though not as spectacular in its occurence as American foulbrood, it probably causes a greater financial loss in many beekeeping localities, simply because so little is really known regarding all the factors involved in its cause and spread.

Since the coming of European foulbrood to Fresno County, California, was sudden, and the date of its advent is definitely known, and since it has been one of the major handicaps the beekeepers have had to face, I feel that a history of its coming and spread here in the Valley would tend to place the problem before us and perhaps uncover a few clues, pointing at least, toward a partial solution of the disease. In the following paragraphs I will give a bit of the local history of the disease, drawing what conclusions I can from the meager evidence I possess in an attempt to view European foulbrood from a slightly new angle.

In the fall of 1907, "Migratory" Graham unloaded at Kingsburg, California, two cars of bees that he had shipped in by rail from Sacramento Valley, and located them in a series of apiaries running from Traver on the southwest to Reedley on northeast, a distance of about twenty miles.

Early in the fall of 1908, my father, in a bunch of his bees near Traver, discovered three hives that contained dead brood, which he decided after considerable observation, was not American foulbrood, though it looked very similar. At a dance in Reedley a few weeks later, one of Graham's hired men made the remark that all the bees in the country would be dead next year. All the beekeepers present laughed at him, but during the next spring many recalled his words of prophecy and did not laugh. The fall before they had not known what Graham's employee knew; namely that Graham's bees had brought European foulbrood with them, and that it always spread with great and mysterious rapidity in a new territory.

The disease struck swiftly in its typical manner. So complete was its destruction, that by the first of June there was hardly a hive of black bees left east of the railroad from Traver to Fresno.

In 1909, the great percentage of the bees in Fresno County were of the so-called German black strain. Several years before, my father, on the advice of G. M. Doolittle, had requeened all of his hives with Italian blood. Doolittle wrote that there was then in New York state a new brood disease, called New York black brood, which the German bee seemed unable to resist, while the Italian bee possessed the ability to clean up the disease. No other way had been discovered which was of any value in combating the malady. Nor was it known how the infection spread, except that it spread rapidly, and in all probability would sooner or later reach California. My father heeded Doolittle's sound advice, so that by the spring of 1909 most of his colonies, headed by the Doolittle strain of golden Italian queens, survived the attack of the new malady.

It was a good honey season that year for those who had any bees left from the inroads of EFB. My father with his Italian bees produced thirty-five tons of surplus honey, while most of the other beekeepers were lucky to get two or three tons from the same number of colonies. Most of his Italian bees contracted EFB but they were able to clean up the disease and produce a fall crop of honey. All his blacks died, and in many apiaries of other beekeepers who were unlucky enough to have all German bees, every hive died. One beekeeper, for example, had an apiary, located several miles from

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any other apiary, composed entirely of German bees except for two hives, one full-blood Italian and the other a hybrid. On the ninth of April he observed that the brood was dying in most of the hives. A month later all the hives in the yard were dead except the Italian and the hybrid, the hybrid being badly infected.

The bee inspectors, at first thinking the disease was American foulbrood, piled up several apiaries and burned hives and all. Later upon discovering the disease was the New York black brood, they started applying the various treatments then advocated. By the spring of 1910 the disease had spread to the region west of the railroad and the whole country was infected. Soon all that was left in the country were empty hives and colonies of Italian bees. Since then European foulbrood has been with us in varying degree every spring, apiaries in certain localities being infected nearly 100 per cent.

Let us sum up the above history a bit before going on to the questions that it poses. In 1907, there were no known cases of EFB in this region. In the fall of that year Graham imported bees known to be infected with EFB. In 1908, there were a few scattered cases of the disease, just how many I do not know, nor do I know how many infected colonies he had himself that season. Then as now, beekeepers did not advertise how much disease their bees had. By early spring of 1909, most of the apiaries east of the railroad were rotten with EFB. As far as is known there were no apiaries within a mile of any of Graham's, and many of the apiaries that became infected were three and four miles from the nearest diseased hives.

The big question raised by these facts is: how did the disease spread so far and so rapidly? I am sure I do not know the complete answer, but it appears to me, the theory suggesting that the disease is spread by drifting nurse bees is inadequate here, for nurse bees are not in the habit of flying miles from their own hives. Perhaps it is spread by robber bees; certainly they are the only bees that travel miles from home. Even the seemingly far-fetched theory of infected bees leaving the germs of the disease on the flowers they visit has some weight, when the distance the disease spreads is considered. The year 1908 was a poor honey season, so there was probably considerable robbing going on that fall. Certainly, if the disease is spread by robbers, there should have been plenty of opportunities for it to spread sufficiently to cause a serious outbreak the following spring. The year 1909, on the other hand, was a good honey year, and thus there was comparatively little robbing. To me, how European foulbrood infection spreads is still a wide-open question.

There are certainly a number of points concerning EFB that beekeepers know little about. Because American foulbrood is more spectacular in its results, and because it occurs wherever sufficient infected honey is exposed to the bees, and because it results in the sure destruction of the infected colony, it has received much more notoriety than European foulbrood.

We are not even sure just what organism is the contributing cause of EFB, as the bacteriologists now say that the *Bacillus pluton* of Dr. G. F. White is only a phase in the life cycle of the *Bacillus alvei*. But this is only the beginning of the problem; for no explanation is given as to why EFB spreads so rapidly, nor why, once it is in a region, it is always there in a varying degree.

European foulbrood has not received the universal attention accorded American foulbrood because the former is distinctly a disease that occurs erratically; that is, there are only certain sections in the world in which the disease has been, or ever will be, a menace to profitable beekeeping. In many regions its occurence is infrequent and of minor importance. The reasons for this I shall attempt to explain in a following paper. In the British Isles, for example, where the disease seems seldom to have reached serious proportions, the tendency is to treat it like AFB and, as will be noted in recent issues of the English bee journals, **The Bee World** and **Bee Craft**, solve the problem by the highly dubious method (or rather lack of method) of burning both combs and bees. This may be the correct procedure in an area where EFB occurs infrequently, but it is certainly not a good method to use in a region where the disease may sometimes infest whole apiaries. Many times we have had apiaries with nearly every hive infected which, with proper conditions and methods employed, we have cleaned up, and afterwards harvested a

(Continued on page 663.)

Laying Workers*

By Mykola H. Haydak
University of Minnesota, St. Paul

Every beekeeper knows that when a colony of bees becomes hopelessly queenless, worker bees start laying eggs and as a result frames are filled with drone brood in worker cells. Confronted with such a situation, the beekeeper may try several methods of requeening the colony. An old method which is still practiced in some places is to shake the bees somewhere outside the apiary and let them return to the old stand. It was believed that the laying workers would remain at the place where they were shaken where they could be killed, or where they would perish from starvation, or at least that they would not find their way back to the old location.

According to Perepelova, this assumption is not justified. She studied the behavior of the laying workers. There are 80-90% of bees in such a hive which have their ovaries containing eggs but only about 25% of them do actually lay eggs. The bees become restless when the laying workers are removed from the colony. Only during the act of egg laying there are several, three or four, bees around the laying worker as her entourage. Every laying worker lays only about 19-32 eggs during the whole time of its activity. In spite of the fact that they lay eggs, the laying workers clean the hive, the bees, bring nectar and pollen into the hive and perform all other tasks which a normal bee is supposed to do.

It is obvious that the shaking treatment does not help the colony, because the laying workers return to the hive and continue their activities.

Some beekeepers add a frame of brood with a queen cell, introduce a virgin queen, run an old queen into the hive using a smoke method, or unite the laying worker colony with a queenright one.

In the University of Minnesota apiaries, the queen was always accepted when the introduction was made by the honey method as follows: Take a frame with sealed honey and brood from the colony and place it flat on the frames of the hive. With your finger make a depression in the sealed honey. Dip the queen in the depression covering her completely with honey. Let her crawl slowly and place the frame cautiously into the hive. The queen starts laying without delay.

What is the cause of an appearance of laying workers in a hopelessly queenless colony? The increased nourishment of bees is the explanation given in the literature. There is no brood to feed, bees eat pollen and the excess of nutritive substances contributes to the development of the ovaries. However, when drone brood appears which is fed by the laying worker, they still lay eggs. Professor Kozhevnikov explained this fact by a suggestion that there are not enough larvae to be fed and therefore there is still an over-abundance of nutritive materials in the bee body.

Nevertheless every beekeeper knows that if the queen is failing or unproductive, there are no laying workers in the colony in spite of the fact that there is but little or no brood to be cared for.

While conducting a study of various types of apiary management, at the suggestion of Professor M. C. Tanquary, we performed the following experiment at the University. Just at the beginning of the honey flow (June 30) two colonies were made, consisting of several 3-pound packages of bees. One colony was left queenless, the other had the queen caged in the hive. Thirty-one days after the first colony was formed, an abundance of open drone brood was found in the hive. The second colony, in which the queen was caged did not have either eggs or brood for 65 days. On September 3 the queen was released and 7 days later there were plenty of eggs, and larvae up to two days of age were found in the hive.

This observation shows that one cannot so easily explain all the phenomena in the life of a bee colony on the basis of a preconceived pattern. There are some other, I would like to say, psychological factors, which play an important role in the reactions of a bee colony toward the internal and external stimuli.

*Paper No. 406, Miscellaneous Journal Series, Minnesota Agricultural Experiment Station, St. Paul.

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Straining Honey

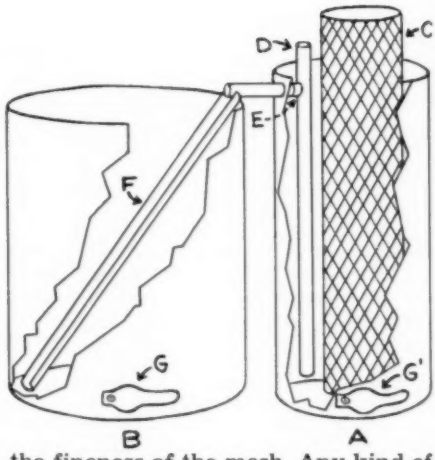
By D. H. Morris

As straining honey is one of the major problems of the beekeeper, I have been trying various methods for years with more or less of a success. I never could get good clear, clean honey by the settling system and I have seen tons of honey put up by commercial producers who did not have any more success than I did, while straining by the ordinary methods was too much of a bother and loss of time in changing strainer cloths. I have changed strainers as much as three times on a barrel of honey.

I devised a straining system that I have used for the past four years that gives me very good results. It is more or less the ideas of several combined in one.

To begin with, my honey is heated from 90 degrees to 110 degrees in the extractor. To do this, I turned the extractor bottom up and soldered cleats or small pipe straps over about 30 feet of ⅜ inch copper tubing such as is used for oil lines on trucks. Then, I filled the V shape of the bottom of the extractor full of mineral wool, or any other good heat insulator. I then soldered four stove bolts on the bottom so that ½ inch extends beyond the level of the bottom of the extractor. Next, I cut a piece of insulating board (Celotex) and bolted it to the bottom of the extractor. That held the mineral wool in place while the extractor was turned back to its original position, also in moving the extractor. It also gives an inlet and outlet for the copper coil. If one wants to heat the honey hotter, or extract faster, make more coils in the bottom. I do my own uncapping and extracting, but where there are two men doing the work it would take a longer coil. I turn on just enough steam so that water and a small amount of steam comes from the exhaust side of the coil.

Now, to strain the honey: I have two tanks. A is 20″ in diameter by 41″ high, while B is 32″ in diameter by 36″ high. C is an expanded metal tube 10″ in diameter by 48″ high. Inside of C is the cloth strainer. I used cheese cloth last year, finest grade, and strained out ten thousand pounds with one strainer before washing. The life of the strainer depends upon



the fineness of the mesh. Any kind of weight can be used to hold the strainer down and prevent it from floating. I use a glass frog such as is used to hold cut flowers in a dish. D is a tube that goes to within 1″ from the bottom of A, then in a tee near the top of D and the tube is fastened to it by a taper fit at E. F is a trough that lets the honey flow out of E and go down an incline in the tank B. Regardless of the height of honey in B the honey from E does not go over ½″ below the surface. G and G-1 are faucets. G-1 is used only in changing strainers or when one is through.

In starting, I let my extractor fill up to the point where the reel won't swim, then I drain off just enough honey to let the reel move freely. By this honey being heated in the bottom of the extractor, all cappings come to the surface much quicker than in cold honey. Therefore, the honey that is drawn out of the extractor in small quantities to start with, is practically free of cappings. This is done to prevent clogging the strainer on the start. I do this until tank A is full or nearly full. After that I can pour the honey in tank A as fast as I wish.

Here is the secret of the long life of the strainer. When honey is poured in the strainer that honey does not go down in the honey that is in the tank over 10 or 12 inches, consequently all the cappings and foreign matter stay at the top, while the

honey that goes to the bottom part of the strainer is practically free of foreign matter.

Now, so many have trouble with foam in the honey. If you will notice the tube D goes to within one inch of the bottom of tank A, and all the honey that passes over into tank B comes from the bottom of tank A, consequently it is practically free of foam. Last year I let two tanks full stand a day or two in B before I drew them off and I could have put the foam from both tanks into a pint jar. The space between the strainer and the tank wall in tank A catches a large percentage of the foam, that in that part that does go through the strainer. Of course, there is quite a bit of it that stays in the strainer and comes to the top there. To make one of these outfits for a big commercial producer, make the strainer tank higher. And to eliminate what small amount of foam that passes over into tank B, make tank A larger in diameter.

I have used a great many straining systems, but this fills the bill better than any I have ever tried. Last year I strained ten thousand pounds with one strainer cloth without washing.

It is very important to have the strainer holder or expanded metal tube higher than the tank, as when the honey commences to clog the strainer there is a pressure of the honey from the top of the last of the honey in tank A to the top of the strainer on the honey below, so you can see it has to go through. When the honey commences to pile up in the strainer, it is time to wash up or change the strainer. Tube D could be soldered direct into the cross-over tube E, but it would be very inconvenient when it comes to washing up the outfit.

The above outfit has a storage capacity of about eighteen hundred pounds and it does not take up very much space. If one was in a hurry, honey could be canned from tank B as fast as extracted and the amount of foam per 60-pound can would not be detrimental. It would also be free of any wax.

Swanton, Ohio.

[This is one of the simplest and best strainers we have seen.—Ed.]

A Demonstration Yard

The Schenectady County Beekeepers' Association maintains this yard of 125 colonies at Schenectady, N. .Y, in the heart of the clover and buckwheat regions.—A. W. Chadwick.

Yummy honey chocolate chip cookies.

Delicious and Satisfying

By Mrs. Benj. Nielsen

Honey Assumes Prominent Place in Preparing Foods for Cooler Days

It's fun to plan meals this month! There's a zip, a tang in the air that puts a spring in the step and an urge in the appetite. Fat golden brown doughnuts, apple tasties, fragrant spicy gingerbread, barbecued spareribs, luscious puddings—they go with the rustle of autumn leaves. So without more ado here they are—and may the flavorful goodness of this month's honey recipes please both the cook and her family tasters.

After a dish of honey sweetened fruit, or a honey drizzled grapefruit half there's no better way to start off the day than with delicately browned

Honey French Toast

Break 2 eggs in a bowl, beat with a rotary beater until very light, add 2 tablespoons honey and beat again. Pour into a shallow dish and into it dip slices of bread, coating both sides evenly and thoroughly. Fry in hot fat until golden brown being careful not to burn. Serve piping hot with plenty of honey. This amount makes a dip for 4 slices. We especially like honey crushed wheat bread prepared this way. Reinforce it with crisp curls of bacon or ham, eggs sunnyside up, if you prefer, steaming hot honey sweetened coffee—and the day's off to a good start.

Here's another satisfying tempter that puts one in a good mood to tackle the day's work:

Honey Apple Griddle Cakes

One and ½ cups sifted flour, 3 teaspoons baking powder, ¾ teaspoon salt, ¼ teaspoon cinnamon, 1 egg well beaten, ¼ cup honey, ¾ cup milk, 3 tablespoons melted shortening, and 1 cup finely chopped, pared, and cored apples.

Sift dry ingredients together. Combine egg, honey, milk, and shortening; add to dry ingredients and stir until smooth. Add apples and mix well. Drop by spoonfuls on hot griddle, greased or not as your griddle requires. Cook until the cakes are full of bubbles and frilly around the edges, then turn and cook on the other side. Serve piping hot with honey and butter, or a honey butter made by working into softened butter as much honey as the butter will receive.

Barbecued Spareribs

One-fourth cup honey, 1 tablespoon chili powder, 1 tablespoon celery seed, 1 teaspoon paprika, 1 teaspoon salt, 2½ pounds spareribs, 1 cup condensed tomato soup (undiluted), and ¼ cup mild vinegar.

Combine honey, chili powder, celery seed, paprika, and salt; blend to a smooth paste and rub it on the ribs. Place in a shallow pan and bake, uncovered, in a moderate oven, 325 degrees F., for 2 hours, basting frequently with the tomato soup to which the vinegar has been added.

Whole Wheat Honey Buns

At our house everyone scrambles for the heel or end crust of the bread. To avoid this scramble and the inevitable disappointment for the unlucky

losers we worked out a honey bun. Now everyone has a crisp, crunchy, golden brown crust and everyone's happy. These delectable whole wheat honey buns are without peer for flavor, lightness, and downright goodness.

One and ½ cups potato water (potato added to it) 1½ cups lukewarm water, 1 cake (Fleischmann's) compressed yeast, 1½ teaspoons salt, ¾ cup honey, ⅔ cup Mazola cooking oil, 4 cups whole wheat flour, and 4 cups sifted all-purpose flour.

Put 1 medium-sized potato and the water in which it was cooked through a sieve. This should measure 1½ cups. Dissolve the yeast in the warm water. Add salt, honey, and cooking oil to hot potato water. Allow to cool to lukewarm. Then add yeast and enough flour to make a soft dough, not as stiff as for bread dough. Knead until smooth. Let raise until double in bulk. Knead down and allow to raise again. Pinch off small pieces and shape into buns. Place well apart on greased baking sheets. Let raise until very light. Bake in moderate oven, 350 degrees F., for 30 minutes. Brush tops with butter (omit if crisp crust is desired) and removing from pans leave inverted to cool. This prevents steaming and soggy undercrust.

Honey Baked Beans

One cup dry navy beans, 1 cup milk, ⅛ teaspoon salt, ¼ cup honey, ½ pound small pork sausages, and 2 tablespoons minced onion (optional).

Soak beans overnight in water to cover. In the morning parboil beans in salted water until the skins begin to loosen. Drain. Heat milk; add salt and honey. Place beans and onion in baking dish and add milk mixture. Arrange sausages on top. Bake for 3 hours in a moderate oven, 325 degrees F.

Honey Chocolate Chip Cookies

Generations old is the bucket pictured but modern as tomorrow are the cookies tumbling from it. To be sure the recipe for them is a honey version of the yummy chocolate chip cookies everybody raves about. In these I used Nestle's Semi-Sweet Chocolate, in the yellow wrapper. Their new bar comes in a 160-division mold, each piece just the right size for use in these cookies and other delectable chocolate treats. It doesn't melt in baking and it's so easy to use. Just have the bar at room temperature, or slightly above; leave it on the inner foil wrapping after opening; then a little pressure on the knife along the indicated scoring and it's ready to use. Just shake it into the bowl when you're ready and there's no messy container to wash!

One-half cup butter, ½ cup brown sugar, ½ cup honey, ½ teaspoon vanilla, 1 egg, 1½ cups sifted flour, ½ teaspoon soda, ½ teaspoon salt, ½ cup chopped walnuts, and 1 Economy size bar (7 oz.) Nestle's Semi-Sweet Chocolate.

Cream butter, add brown sugar, and cream well. Add honey gradually and beat until light and fluffy. Add vanilla. Stir in well beaten egg; mix well. Add flour sifted with soda and salt. Then add the nutmeats and the chocolate, cut in pieces the size of a pea. Mix well. Drop by teaspoonfuls well apart on greased cookie sheets. Bake in a moderately hot oven, 375 degrees F., 10 to 12 minutes. Makes 4½ dozen cookies.

Orange Gingerbread

One-half cup butter, ½ cup brown sugar, 2 eggs, ½ cup honey, ½ cup

Healthful whole wheat honey buns are without peer for flavor, lightness, and downright goodness.

orange juice, strained, 1½ cups sifted flour, 1 teaspoon baking powder, ½ teaspoon soda, ½ teaspoon salt, 1 teaspoon cinnamon, ¾ teaspoon ginger, and ¼ teaspoon allspice.

Cream butter with brown sugar. Add honey gradually and continue creaming. Add orange juice, well beaten eggs and mix well. Sift flour, measure and sift with baking powder, soda, salt, and spices. Add to first mixture and beat until smooth. Pour batter into well greased pan. Bake in a moderate oven, 350 degrees F., 25 to 30 minutes.

Banana Pudding

One and ½ cups soft honey bread crumbs, 2 cups scalded milk, 2 eggs, ⅓ to ½ cup honey, ½ teaspoon vanilla, 2 tablespoons melted butter, ½ teaspoon salt, 3 bananas, diced, and ½ cup chopped walnuts.

Add the crumbs to the scalded milk and set aside to cool. Beat the eggs until light, add honey, vanilla, melted butter, and salt. Combine with the bread mixture; fold in diced bananas and nutmeats. Pour into a buttered baking dish. Bake in a moderate oven, 375 degrees F., about 35 minutes, or until a silver knife, inserted in the center, comes out clean. Serve with honey sweetened whipped cream.

Beets in Orange Sauce

If you are a bit tired of those honey canned beets "as is" try this:

Two tablespoons flour, ½ teaspoon salt, ½ cup orange juice, ⅓ cup honey, 2 tablespoons butter, and 2 cups diced beets.

Mix flour and salt. Place in upper part of double boiler. Add orange juice slowly, stirring constantly until smooth. Stir in honey and butter. Bring to a boil stirring constantly. Add beets and continue heating for 10 minutes.

Stuffed Apples

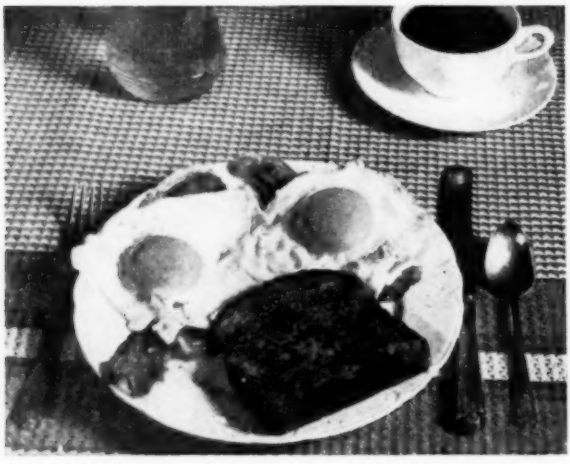
Six large apples, ½ cup chopped dates, ½ cup honey, ¼ teaspoon cinnamon, ⅓ cup crushed pineapple, well drained, ⅛ teaspoon salt, 2 tablespoons butter, 1 cup unsweetened pineapple juice, and ½ cup brown sugar.

Wash and core apples. Place in baking dish and stuff the centers with dates mixed with honey, cinnamon, pineapple and salt. Dot with butter. Surround with the pineapple juice and brown sugar. Bake in a moderate oven, 350 degrees F., for 45 minutes, basting occasionally.

Honey Orange Doughnuts

Two tablespoons shortening, ⅔ cup honey, 2 eggs, 1 tablespoon grated orange rind, about 4 cups sifted flour, 2 teaspoons baking powder, ¾ teaspoon soda, ½ teaspoon salt, and ¾ cup orange juice.

Cream the shortening and honey thoroughly; add the well beaten eggs and orange rind; mix well. Add sifted dry ingredients alternately with the orange juice. Chill dough for 3 hours. Roll out to ⅜-inch thickness on a lightly floured board. Cut with doughnut cutter. Let stand 15 minutes. Fry in deep hot fat turning only once. If a deep fat frying thermometer is used it should register 365 degrees. If a thermometer is not available the bread cube test may be used: a one-half inch cube of bread should brown in 60 seconds. Drain doughnuts on absorbent paper. Dip in confectioner's sugar if desired.



Golden brown honey French toast and honey sweetened coffee start the day off right.

Bee Hunting De Luxe

By Penn G. Snyder

There is an old truism that "one half the world does not know how the other half lives". The following will tend to show how true this is.

When we enter the country of the Latin peoples we enter an entirely different world from what we are accustomed to. As a rule, we find the people divided into two classes. Our so-called middle class is practically out of the picture. The landed proprietor naturally is among the first class and is looked up to and bowed down to, and served hand and foot by those in his employ as well as tenant farmers. We find that time is not so important or so precious as with us. Courtesy and formality is the rule. Even the manners of the bare-foot peon is a revelation.

Shortly after I arrived in Puerto Rico I made the acquaintance of one of these landed gentry. This man, the Honorable Federico Degetau, was Spanish born. He was very brilliant, a college graduate, had several books to his credit, was a lawyer of note and after the United States took over the destinies of the Island he served his new country in a diplomatic capacity. He acted for the United States in a number of the South American Republics until his death in 1914.

When I met him he was at his home in Aibonito on vacation. Don Federico looked me up because he had become very interested in bees. He told me he wished to start an apiary with the so-called Puerto Rican bee.

He gave orders to his peons to make inquiry from the neighbors if they knew of any strong swarms of bees in trees, as he wished to get them and put them into modern hives. Word arrived a swarm had been found. A peon was then dispatched to my house with a note for me and a saddled horse for my conveyance to the casa (home) of Don Federico. At that time I did not possess a horse of my own.

In due time I arrived for the noon day meal. After our bountiful repast we mounted our trusty (?) steeds, (all of them were stallions) and away we went following a barefooted peon who on foot led us by cross country bridle paths and tree shaded roads up hill and down. We were followed by a retinue of footmen (the burden bearers). Most things are carried on the heads of the native working class, or peons. One had a 10-frame hive stapled together, another had a coil of rope and an ax which is seldom seen on the Island or in the tropics. The last peon carried the smoker and fuel. In all we were comprised of three horsemen and four footmen all bound on the capture of one lone swarm of bees. All the peons carried swordlike knives, known as machete's, strapped to their waists or in their hands. These machete's are used for many and various purposes—to mow the lawn or to cut down a tree. I have myself seen a peon cut a banana tree or plant eight inches in diameter off clean with one full arm stroke of the machete. They are also used to carve up a rival at times.

We rode for about an hour and a half over beautiful parklike country. There is practically no level country in the interior of the Island. The hills and valleys were sparsely covered with trees. Tree ferns and Royal Palms were plentiful, the latter tree is one of the most beautiful trees in the entire world. We at last reached our destination, the tree in which the swarm had set up housekeeping.

As master of ceremonies, I lighted the smoker and made a smoke screen about the opening in the tree. Fortunately it was only about eighteen inches from the ground. The peons then took up the task of making the opening larger with their machete's which they used in preference to the ax.

There were plenty of verbal directions given by the horsemen but no active assistance with the exception of myself, and I at this time using only the smoker.

The bees were black and hot. They made things interesting for all of us, including the horses which had to be moved some distance from the bee tree. None of us was provided with veils and the bees certainly were Tartar's. I had already found this to be the average disposition of most of the bees on the Island at that time.

(Continued on page 662)

XUM

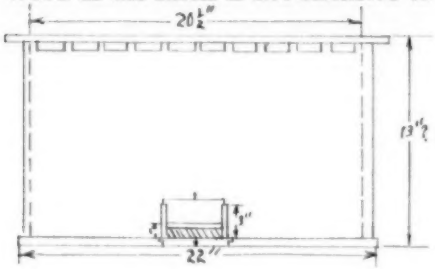
Directions for making of Colonies for Bees, and by a new invented Model of Hive, to Improve them, whereby without killing, may be enjoyed the Fruit of their Labour.

From **A Collection of Letters for the Improvement of Husbandry and Trade.** By John Houghton, Fellow of the Royal Society. (Tuesday, June the 16th, 1683.) —Submitted by Prof. H. F. Wilson, Madison, Wis.

SIR,

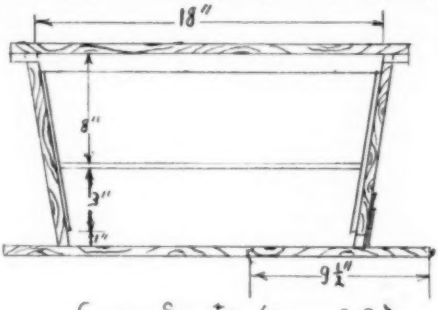
Having this following **Account** by me, I thought it might prove no small Advantage to our Country, if it were brought in use; which it is probable may be, if you will insert it into your **Collection of Letters for Improvement of Husbandry and Trade.** It is as followeth, **Viz.**

Take Boards, in thickness full half an Inch, plained on the one side, of which make a Hive, in form like unto a four square Box, observing to turn the plained side of the Boards innermost, and to have them of such Wood as the smell is not offensive to



Front View

Bees: the length of which Hive is to be twenty Inches and a half within, as well at top as at bottom, and the breadth betwixt Front and Rere, to be eighteen Inches within at top, but at bottom only fiveteen Inches, the ends to be nailed through the sides, and the top to be open, but on the bottom a board to be nailed of twenty two Inches square, that so it may cover on all sides the top of another Hive, or Colony, that may be placed under it: Then prepare ten straight sticks, plained smooth, of twenty one Inches long each, in thickness an Inch, and in breadth one Inch and a half; which sticks must be laid cross the top, from Front to Rere, at the distance of half an Inch from one another, a vacancy of half an Inch to be left at each end, betwixt the two outermost sticks and the ends of the Box, and at these distances they are to be let down half an Inch into the two upper edges of the Box, Front and Rere, and the sticks themselves are to be taken off half an Inch more of their thickness at each end, on the under side one Inch and half in length, whereby being let down square and even, the top side of the sticks will come just level with the tops of the sides and ends of the Box or Hive, so as that it may be close covered with a loose square Board or Plank well fitted on, as close as may be, to advance an Inch over the top of the Box on each side, that if occasion be, the Joynts under the Edge of the Plank may be stopt with Clay in the Winter time, and a Brick, or some other weighty thing be laid thereon to keep it fast down; or by setting

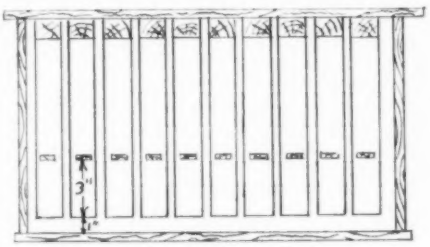


Cross Section (from Side)

another Box or Hive upon it, the bottom whereof, upon occasion, hereafter mentioned, to serve as a cover; into which cross sticks are to be framed, at each end thereof, another flat stick or lath of an Inch and half broad, and of a quarter of an Inch thick, which are to run down flat by the two sides Front and Rere, on the inside of the Box within an Inch of the bottom; and within three Inches of the lower end of the Laths is to be fixed in each Frame a cross stick of about three quarters of an Inch broad, to keep the side Laths out close to the sides; in each of which Frames it is designed that the **Bees** should fix a **Comb,** beginning at the top of the Box on the under side of the cross sticks; which Frame, when wrought full to the bottom, will each of them contain an intire **Comb** of the whole breadth and depth of the Hive or Colony; and by this means you may at your Conveniency (first taking off the top Board of Plank) draw out a whole **Comb,** it not being wrought to the sides, but in the frame, and the lower end being nar-

rower than the upper, it will come up with ease, so that in the **Spring**, when you would increase the Number of your Hives, and make two of one, you may, and thereby prevent their **Swarming**, which in **G R AE C E** is in this manner practised.

Having in readiness always a number of new Hives sufficient to supply their expected Increase, each fitted with a fit number of Frames, as is above directed, which Hives and Frames are all of the very same Dimensions, so that when any of the Frames are taken out of one Hive, they may exactly fit another; then, in the Month of **March** or **April**, as they see the Hives well stock'd with full numbers of **Bees** (which by their working may easily be perceived)



Cross Section (from front)

they begin first with those that are the fullest with Bees, and take off the board that covers the Hive; which if they find to stick, by reason of any **Combs** wrought or fixed to it through the Intervals of the Frames, they quickly separate it therefrom by giving it a twist or half turn; Then they draw out the Frames one by one, with the **Combs** and all the **Bees** that are upon them, beginning first at the ends, and placing them in the new Hive (which is always ready provided, and stands by without any Frames in it) where each Frame is put in, in the very same order that they stood in in the old Hive, and so proceed 'till half the Frames be removed, which vacancies in the old Hive are supplyed with new Frames, and the vacancies in the new Hives also with empty Frames, for the **Bees** to go to work upon, then they cover both the Hives with their own boards, and set the new Hive in the old ones place, and the old one in a new place: and all this is done by them in the middle of the day, when the greatest part of the **Bees** are abroad, who at their coming home, without much difficulty, divide themselves equally; this Device hinders their **Swarming**, and prevents their flying away and being lost.

It might not be amiss to try what the effect would be, if this work were performed in the Night, according to the **English** way, noting which way gives least disturbance to the **Bees**.

Also, it being done the other time, to observe whether at the Return of the **Bees** that are abroad, most of them go to the new Hive, or to the old one, and accordingly, when the **Combs** are a shirting, to take more or less of them out, according as you shall find this generally to be: for if they do resort most to the new Hive that stands in the old ones place, you need then to shift no more than four of the ten Frames into the new Hive, letting the other six remain in the old Hive that stands in the new place, where it is prevented from receiving the Supplies by the resort thereto of the **Bees** that were abroad at the time of its shifting, they not knowing where to find it at their Return.

When you draw out the Frames with the **Combs** and **Bees** upon them, and find them to come out pretty easie, it were worth the tryal, whether it would not be less disturbance to the **Bees** (if it can be done) to remove two or three Frames at a time, which may the better be done by the clapping of a short piece of Lath, of about a handful long, under the end of those Frames that you intend to take out together, by which you may also keep the Frames at an equal distance when you let them down into the new Hive.

And this must be observed when you put any empty Frames into Hives, to place the bottoms of these Frames at an equal distance as well as the tops; otherwise the **Combs** may be fixed beside the Frames in the Intervals, fast to the sides of the Hives, and then it will not be easie to draw out the **Combs** without breaking of them. But if this way of drawing out two of the full Frames together as above doth prove feasible, then the best way will be, to make a good part of the new Frame two joyned together at bottom and top, especially those that are to be placed next the ends of the Hives; which will be a good means to keep so many of them at their true distance at bottom.

Now the best Method to enjoy the Fruits of these Creatures Labours,

and without destroying of them, to take from them their **Honey** and **Wax**, and without using that noysome way of smothering with **Brimstone**, is done in this manner.

Your Hive having a Mouth or Door cut in the middle of the bottom of the Front side, for the **Bees** to pass in and out at, of about an Inch high, and three Inches wide; on each side of which Mouth is fixed a Groove of three Inches high on the out side, wherein doth run up and down pretty stifly a little Trap-Door, wherewith to shut the Mouth of the Hive when there is occasion, under which Mouth there is also cut another hole in the bottom board, of about four Inches and a half wide, and six Inches deep from the inner side of the Hive; in the side edges and further end of which hole must be cut a Groove to let in a false Door of the same substance as the bottom board is of, that so when 'tis shut, it may be plain and even on both sides with the rest of the bottom board: the use to be made of it is this.

About the Month of **August**, or sooner, if you find the Hives well filled with **Wax** and **Honey**, prepare so many new Hives as you have old Stocks, all fitted with Frames and bottom-boards, as if before directed; which old Stocks being placed in a row upon broad Planks that are set upon Posts drove into the Ground, about a foot high, they, the old Stocks or Hives standing at such a distance from one another, as that there may be room enough betwixt Hive and Hive, to place in those Intervals the new prepared Hives, without any top-board upon them, then in the Evening, when the **Bees** are all at home, you are to shut close down the Trap-door over the Mouth of the old Hive, that so the **Bees** may not offend you, then you are to take up the old Hive, closed as it is, and set it plumb, directly even on all sides, upon the top of the new Hive that stands by, without any Cover, the bottom-board of the Hive that you put a top supplying the place thereof; then draw out the false door that is in the said bottom (now middle) board, as far as the inside of the Front of the upper Hive, and no farther, still keeping the Trap-door that covers the Mouth of the upper Hive close shut down (but that of the under Hive to be open) so that the **Bees** having no other passage out but through the false Door in the bottom-board, they will betake themselves to the new Habitation below, and begin to frame new **Combs** therein, not delighting to lye among the **Honey** above, if they have place otherwise.

And when you find that they have well taken to the new Hive, which may haply be in a Fortnights time (but would best be discovered through a small Window of Glass fixed in the Front of the Hive) then thrust in the false Door that runs in the **Groove** in the said bottom-board of the upper Hive, which is now betwixt the two Hives, by which means you shut out the Bees that are below from the **Honey** and **Wax** above; in which Condition let them stand two or three days longer; in the meanwhile, if any **Bees** be left behind in the upper Hive next Morning, you may open the Door and let them out, and at Noon-day when they are gone, shut them out, and a few days after in the Evening, you may take away the upper Hive, and in its room cover the lower Hive with its Top-board, so to remain all **Winter;** before which it may be expected the **Bees** will in their new Habitation have gathered a sufficient quantity of **Honey** for their Maintenance 'till next Spring. And thus have you the Fruits of their former **Summer's** Labour at your Mercy.

When you have taken the **Combs** clean from their Frames, you must also cleanse the Hive that you took them from, either by hot Water or scraping them, being carefully laid up, they will serve again next year.

Sir,
Your Humble Servant,
J. A.

[Here is a description of a movable-frame hive bearing date as early as 1683, similar to Langstroth's of 1852, but with a bee-space of half an inch instead of ⅜ inch as in the Langstroth hive. There were other movable-frame hives of early days but without the all important and necessary feature of a bee-space all around the frames.

This is printed verbatim, spelling, capitals, and all, and as such is of great historic value. The methods of manipulation are almost modern. It comes near antedating the Langstroth hive and frames.

Had A. J. King and others who were trying to break down the Langstroth patent known of the reference to this hive which was made 169 years prior to the appearance of the Langstroth hive, with a space all around the frames, they might have broken down his patent. It is fortunate that they did not. It should be remembered that Langstroth had a correct bee-space.

We are indebted to Prof. F. H. Wilson for this reference.—Editor.]

From the Field of Experience

CHANGES IN FLORIDA BEE LAW

By Robert A. Foster

The Legislature of the State of Florida, at its 1939 Session, amended Section 1 of the Florida Bee Disease Law. This section, as amended, reads as follows:

"Section 1. All honey bees (including bees in wire cages, with or without combs or honey) shipped or moved into the State of Florida shall be accompanied by a certificate of inspection signed by the State Entomologist, State Apiary Inspector or corresponding official of the state or country from which such bees are shipped or moved. Such certificate shall certify to the apparent freedom of the bees, and their combs and hives, from contagious and infectious diseases and must be based upon an actual inspection of the bees themselves within a period of sixty days preceding date of shipment; provided, that when honey bees are to be shipped into this state from other states or countries wherein no official Apiary Inspector or State Entomologist is available the State Plant Board of Florida may issue permit for such shipment upon presentation of suitable evidence showing such bees to be free from disease."

This makes it necessary for package bees, as well as other bees, to bear a certificate of inspection when moved into the state.

At the April 15, 1940 meeting of the State Plant Board, Rule 41A, of the Rules and Regulations of the State Plant Board, was amended to read as follows:

"Rule 41A. In accordance with the provisions of Section 1 of Chapter 12,050, as amended by Chapter 19,062, and Section 4 of Chapter 12,050, Laws of Florida, the shipment or movement into this state, from other states and countries, of bees, used or second-hand bee hives, honeycombs, frames, and other beekeeping fixtures, is hereby prohibited except when such shipment is accompanied by a certificate of the State Entomologist, State Apiary Inspector, or corresponding official of the state or country from which said bees or equipment are shipped or moved, to the effect that the apiary in which such bees or equipment originated has been inspected and found apparently free from contagious and infectious diseases within a period of sixty days preceding date of shipment. Such certificate shall be signed by the proper official of state of origin, and shall specify the dates of inspection, number of hives, honeycombs, frames and other equipment, approximate date of shipment, and destination in Florida. A copy of such certificate shall be mailed to the State Plant Board, Gainesville, Florida, at least ten days prior to date of shipment: Provided, that in the absence of facilities for such inspection and certification, the Plant Commissioner may issue permits for the shipment into this state of such bees or equipment upon the presentation of suitable evidence going to show that such shipments are not likely to convey any contagious or infectious disease of honeybees, or upon such equipment being properly disinfected."

The amendment of this rule makes it necessary, in order to move bees legally into Florida, that they bear a certificate of inspection. This certificate must state the time of movement and destination. Also, a copy of the certificate must be mailed to the State Plant Board, Gainesville, Florida, at least ten days before movement.

Gainesville, Fla.

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CONCERNING FUMIGANTS FOR WAX MOTHS

By V. G. Milum

In recent months, new materials for fumigating for wax moths have been suggested, first by H. M. Krebs in the July, 1939, issue of Gleanings which were reprinted in the 1940 edition of A B C and X Y Z of Bee Culture. In the March, 1940, issue of Gleanings, G. F. Townsend of the Ontario Agricultural College, reports the results of a fine piece of investigation on these newer chemical controls. Our own results with Chlorosol had already convinced us that it should not be recommended, but convincing reasons are given in the last article referred to.

Apparently then there is only one new fumigant available for wax moth fumigation other than the use

XUM

of the older methods of using carbon disulphide, Cyanogas or fumes of burning sulphur. If Methyl Bromide is to be adopted as a fumigant for wax moths by beekeepers, there are certain precautions that should be followed.

While it has been pointed out that Methyl Bromide is less dangerous than Cyanogas, one using the fumes should not take chances. In their literature, the manufacturers suggest the use of a gas mask when using Methyl Bromide, although this precaution may not be necessary for the careful worker who understands the reactions of the material being used.

For fumigating with Methyl Bromide a fumigation chamber is absolutely necessary. If this chamber is inside a building, extreme care must be used to ventilate the chamber and the room after its use. Preferably the chamber should be built outside or in a screened enclosure.

While Methyl Bromide kills all stages including the eggs, which is a decided advantage over previously used fumigants, care must be taken to prevent re-infection by storage of the fumigated materials in a wax-moth-free enclosure to prevent the adult females from again laying eggs in the cracks and crevices of the supers or containers. Someone has reported that as many as 1800 eggs may be laid by one female wax moth, the writer having counted a total of 1610 eggs from one female. Is it any wonder that wax moth populations increase so rapidly in combs with the resultant severe losses even with a small initial infection?

These suggestions are in no way a criticism of the fine articles referred to but are merely offered as precautionary measures to be observed by beekeepers when using any fumigant.

Urbana, Ills.

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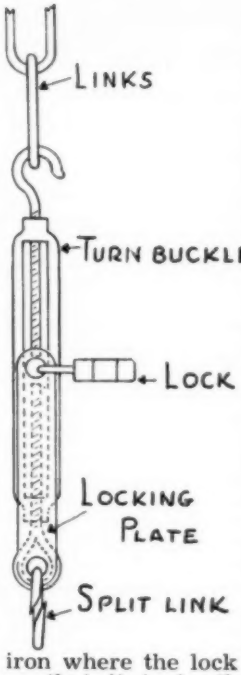
A BURGLAR-PROOF HIVE

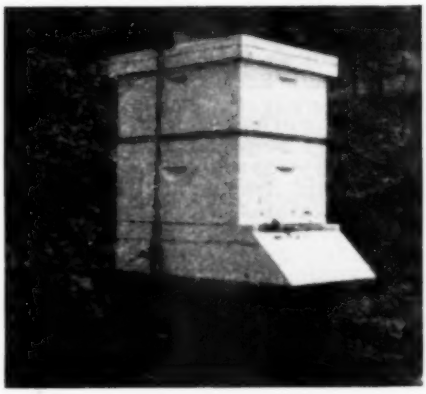
By James O. Ashbaugh

The concrete blocks of my hive stand are 17x22x9 inches, outside measurements, with two hollow cores each 6x9 inches by the width of the block, and are home-made in my workshop during the winter months. The dimensions of the block are, of course, for 10-frame hives.

To secure the stand and the hive parts in one unit, a chain is put through the concrete block and around the hive and drawn together snugly by an ordinary quarter-inch hook and eye turnbuckle. I use old auto side chains fastened together by quarter-inch end-split repair links. I also use a repair link to fasten the eye end of the turnbuckle on the chain as well as the lock hasp. This hasp is made of bar iron and has a three-eighths inch hole in each end. One end is slipped in the repair link together with the eye of the turnbuckle, and the end of the chain and the repair link are closed. The hole in the bar iron where the lock enters is placed so that it is in the center of the turnbuckle in order that it will always be open for the insertion of the lock. The chain is put around the hive, the turnbuckle unscrewed to its capacity, the hook entered in a link of the chain and the whole then drawn up tightly by means of the turnbuckle. The turnbuckle must be adjusted so that the flat part is parallel with the hasp and the two locked together. The lock will prevent anyone from turning the chain more



With its concrete hive stand this hive would be quite a load for a burglar.



than a half turn either way. I use a block of 2x4 lumber of sufficient length at the top and bottom to prevent the chain from marring the hive and block.

This method provides a means of always keeping the hive parts together in perfect alignment without shifting. It also prevents the hive covers from blowing off.

The length of the chain can easily be made to fit around any number of hive bodies by simply adding another length of chain and a repair link. By loosening the turnbuckle and slipping the wooden block from between the top of the hive and the chain, the chain can be thrown over the hive to the ground, thereby providing easy access to the hive.

West Point, N. Y.

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STEAMING OLD COMBS OUT OF FRAMES

By H. L. Walton

Burning diseased combs in or near the apiary is wrong unless buried so deep the dogs and skunks can't dig it out. A few shovels full of dirt will not do it. The smell of burned combs attracts bees and all.

My sterilizer is made of an upright 275-gallon oil tank. There is a drip pan that catches all the wax and honey, 8 inches deep on one end held up by two ⅜-inch gas pipes that run from front to back, 2 inches from the side and 4 inches below the door. At the low point of the pan is soldered a ½-inch brass nipple to screw on an elbow, a short nipple to go through the end of tank with elbow, and ½-inch shut off to close when steam is on. On each side of the door and level with it are two 1¼-inch angle irons fastened front and back for the pans and rack to slide on. The pans are 3 inches deep with a hemmed flange on each side 1 inch wide. The pans have a ¼-inch mesh wire netting in the bottom soldered in. The rack to hold the diseased combs is made of ½-inch angle iron. Inside the pans is a loose piece of fine netting a little larger than the pan to catch the slumgum and pull out to empty. There are two pans.

Steam comes into the top in 1¼-inch pipe locknut outside. Inside is a ½-inch pipe with four openings to distribute the steam, honey, and wax run into a can, which when full and cold can be separated.

There should be a 1-inch outlet in the bottom with a check valve somewhere on the line to let the condensed steam back into the boiler.

The door at the end has packing around it and is made tight by three pieces of angle iron tightened up with thumb nuts top and bottom. The inside is painted all over with aluminum paint to save rusting.

Worcester, Mass.

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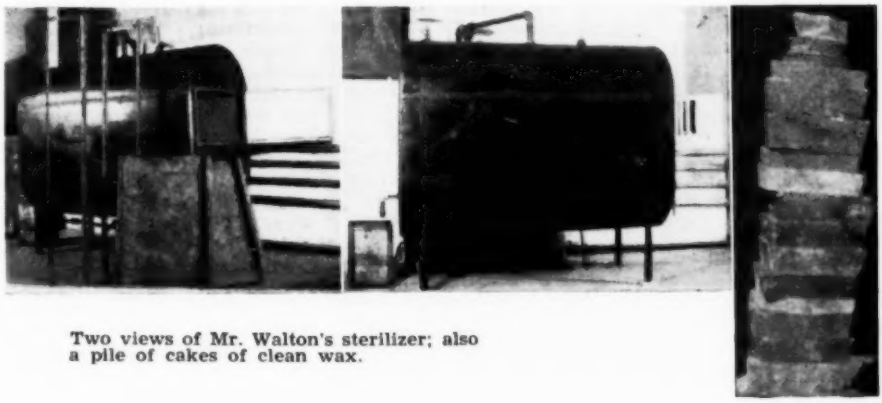
CITY SWARMS

By John Kaspozak

On July 5, 1939, a huckster friend of mine who knew I kept bees, told me he had seen a swarm of bees on a street not far from my home. Immediately I prepared to get the swarm, for I was hoping to get more bees and so establish a few more colonies. When I arrived on the scene, I could not find the swarm so I inquired where it was. I was informed that the police had gotten a gas station attendant to throw gasoline on the swarm to destroy it. I was angry and disappointed to learn that I had been cheated out of a swarm of bees and



Two views of Mr. Walton's sterilizer; also a pile of cakes of clean wax.

XUM

to think that a noble swarm had met such an ignoble end.

I decided to do something to prevent a recurrence of such a fate to other swarms. I went to the police station and asked them to call me if there were any other swarms to be found in the city. They were more than glad to co-operate with me for they were just as scared of the bees as the people who had called them to remove the swarm from their premises. They even sent my telephone number out on the teletype machine to other precincts so that I had the whole city as territory.

Two days later I got a call from the police and I went after the swarm. It was in a tall tree and pretty close to the top. My first assignment proved to be pretty difficult for it took me nearly an hour to get the bees down. First, I had to reach the proper limb, then cut it, and lower the swarm to the ground by means of a rope. Being unprepared for this, the people in the neighborhood supplied me with a knife and a rope.

I have plenty of fun getting the swarms of bees. After I start to work a crowd begins to gather to watch me bring down the swarm. First the children playing in the neighborhood gather around. At first they keep a safe distance away but gradually their confidence grows and they step closer to get a better view. Soon some of them try to grab a handful of the bees as they see me do when I push them into my screened box. At this point I make them step back to make sure that no one is stung.

The older folks gather around after a while but most of them come to get their children away. Then they stay and watch me work. They are always willing to cooperate with me to the extent of supplying me with anything I need to get the bees. A man once brought out a stepladder for me to use. An old woman gave me a scrubbing brush, to brush the bees into my box, although I can't say that it helped me much. Another man supplied me with a knife and a rope which I used to get my first swarm. Usually the men get me into conversation about the bees and I have to answer any number of questions. It takes me longer to answer the questions than it does to get the bees. However, I try to answer them all, even the silly ones. In this way I remove some of the false ideas that people have about bees.

I caught seven swarms during the season, but once somebody beat me to a swarm and I read several newspaper accounts of other swarms in different parts of the city, to which I had not been called. Most of the swarms I caught were pretty large and one swarm weighed five pounds.

This is a good way for a beginner to get started or a small time beekeeper to make increase and to replenish winter losses. I must, however, warn you of a few things which I learned through experience. First one must be prepared with the proper equipment to meet any difficulty which may arise. This consists of a rope, screened box to put the bees in, a bee brush, and a knife which will come in very handy. Then one must be able to climb trees, for most of the swarms that I got were in trees. Have the police cooperate with you and if you have no telephone, check with them every day that you can. This is very necessary, for you might get two swarms in one day like I did once.

I keep my colonies on a small farm about three miles from the city. This is within easy bicycling distance and I visit them whenever I have some spare time.

Buffalo, New York.

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REQUEENING BY SUPERSEDURE UNSATISFACTORY

By E. S. Miller

The beekeeper who depends upon supersedure as a means of requeening is liable to lose a good many swarms and, in my opinion, a considerable portion of his profits. Not only must supersedure after the honey flow be considered but also the fact that where queens are old or inferior, many attempts at supersedure take place before or during the honey flow, resulting in excessive swarming. Such colonies often become queenless. Furthermore, where supersedure does not occur and colonies are not requeened, a considerable number become queenless in late fall or early spring.

After the clover crop is removed, preferably in August, one should be sure that every colony has a good queen not over one-year old. One-half of the yard may be requeened each year, removing all two-year-olds. Failing queens, of course, should be replaced at once regardless of age. It is advisable, for the purpose of identification, to clip all queens before introduction.

In this locality, colonies requeened the previous year with good queens seldom attempt supersedure. Also, during the clover flow, we find our two-year queens fully equal or superior to those in colonies requeened the current year previous to the flow. This I attribute in part to superiority of stock improved through years of careful selection. Purchased queens have not been found so dependable.

The apiarist who aims at intensive rather than extensive beekeeping, that is, in keeping better bees with more profit per colony, will find it advisable to rear his queens from the very best stock and not leave it to the bees to propagate their kind. Supersedure as a means of requeening does not lend itself to the improvement of stock.

Valparaiso, Indiana.

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BEEKEEPING IN CZECHOSLOVAKIA

By William Anyz

Your readers might be interested in a few observations which I made while travelling in Czechoslovakia just before the Munich crisis.

As an American beekeeper I found apiaries in Czechoslovakia quite different from ours in this country. The beekeepers there are gradually adopting American methods although the older ones still cling to the old type of hive which opens up in the back revealing a glass panel through which the bees can be seen but not disturbed.

There is no large-scale beekeeping going on because the flora is not sufficient to cover the needs of the beekeepers. They are compelled to make provision for feeding their bees with sugar at one time or another during the year. This condition is slowly being remedied by the planting of additional nectar-bearing forage and trees.

Most of the honey is marketed by selling it at a fair price to a central agency in Prague which in turn sells it at a fixed retail price to customers thus preventing under-selling.

The beekeepers have formed an Association which, outside of the social benefits which its 100,000 members enjoy, offers them free legal advice pertaining to their beekeeping business, and insures their bees against fire, theft, and loss. The Association meetings are well attended and there is a great co-operative spirit prevailing. The organization publishes a monthly magazine, a Handbook, and a Yearbook which summarizes its activities and offers helpful suggestions. Subscriptions to these publications are included in the annual dues of the Association.

Czechoslovakia is divided into many beekeeping districts. Each district has its own queen-rearing and experimental station to further and aid the beekeepers in that locality. The beekeepers themselves are starting to experiment with crops to increase their honey yield. Gradually they are diverting beekeeping from a pleasant hobby to a profitable sideline. This has been due to the steady introduction of American methods.

In Brno, Moravia, the Beekeepers' Association Home, now a Museum, houses the model of the first honey extractor in Europe. It was invented by a Cech, Frank Hruska, and was demonstrated there by him for the first time on September 13, 1865 at the Association Home.

Schenectady, N. Y.

The author and some beekeeper friends in a Czechoslavakian apiary.

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SECOND GLANCES

C. M. Isaacson

Dr. Fife's article (page 545) is a portrayal of an unusual man. Successful management of his enormous apiary system is proof enough of N. E. Miller's ability. As for character, I wonder if there were many who did not like the incident related, of his refusing to take advantage of the temporary distress of a fellow beekeeper by buying his mortgaged apiaries. His own difficulties had made him appreciate distress in others, but even so, not every man would have done likewise.

Beekeeping history is a succession of new practices and equipment. It may be that the top entrance will join the movable frame, food chamber hive, etc., when beekeepers generally learn to understand it better. John Conner's article makes clear the basic principles that must be satisfied in a real top entrance. His idea of the vestibule as an "idling place" for reserve bees raised before the flow, thus cutting down the danger of early swarming, is an interesting one. It should be worthy of trial at least.

The facts expressed in "The Bee of Mystery" (page 553) are certainly right. The article makes clear that the worker is far nearer to the supposed solitary bee ancestor, than the comparatively helpless queen. A bumblebee queen, on the other hand, is much like the worker honeybee in capabilities.

The article entitled "The Bee Sting Cure" (page 354) by Editor Root, is certainly interesting to say the least. It seems that a long believed in use of bee venom as a medicine, is being developed by the medical profession. Let us hope that the treatment is perfected—it will help many—and incidentally, if this use becomes well known, it may help to reduce the fear bees hold for many people.

How many times haven't I heard that "I don't use honey until cold weather"! Mrs. Nielsen has mentioned a widely held fallacy here (page 556). But with help like that given by her recipe department, beekeepers are gradually being able to convince people otherwise.

N. E. Newell's account of his experiment with package bees seems to show again that too early packages simply do not build up well. The theory of an early start sounds fine but doesn't work out in practice. He is right that early queens often prove failures—I have had much the same experience several times. By the way, his wintered-over colonies gave a good account of themselves; even after supplying brood to the packages, they produced a higher crop.

We often find previously unknown pests developing in the plant and animal world. With the possible exception of ants, honeybees have no serious insect enemies in this country, so let us hope that the bee-killing hornet told of by Mr. Amster (page 562) does not prove dangerous and become widely distributed.

In connection with the editorial on page 567, "Winter Brood-rearing Normal", it would be well to also read J. L. Byer's comments on page 576. He is right in asking for an explanation; if packages can build up so strongly, should the work towards better wintering take the form of encouraging winter brood-rearing, or what?

On page 579 is a point to remember for those of us who practice saving poor combs for super use. It is true that they are then out of the brood nest, but also true that the bees are slow to fill and cap this drone comb. Unripe honey may be present here when worker cells in the same comb are entirely sealed. It might prove more profitable to melt all poor combs when found. (I must admit that I don't always do so).

In "Asked and Answered" is a query about killing bees in a house wall. Cyanogas, as mentioned in the reply, is of course good, but almost as effective and far less dangerous to use, is a good household fly spray. Pump a half pint or so in the opening and close tightly. It works—I have several times killed nests of small wasps inside the eaves or wall in this fashion. Of course, the honey would be spoiled in the case of a bee colony; but after chips, dirt, etc., have fallen into combs already often filled with crushed and dead bees, in the process of removal, the honey is not very attractive anyway.

"Continued next month" might well be put after the account of the American Honey Institute's work; it is always continued, week to week, and month to month. Have you sent in your contribution?

Middle River, Minnesota.

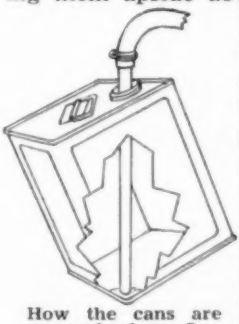
A Small Honey Processing Plant

By E. R. Root

One of the most unique home honey processing plants that I have ever seen is located at Menomonee Falls, Wis., under the name of "Honey Acres" owned and operated by Walter Diehnelt. It is perfect in all its equipment which is of the very best. Mr. Diehnelt, besides being a good beekeeper, is an expert in making honey candy and in processing honey to a crystal clear product. He does not use an expensive filter press with filter aide to help clarify his honey but makes use of ordinary filter cloth using gravity to pull or push the hot honey through several thicknesses. He is careful in how he uses his heat—not too long nor too hot.

Mr. Diehnelt, President of the Wisconsin State Beekeepers' Association, appears at the left with Mr. H. J. Rahmlow at the right. The next pictures show first his home apiary located at the end of the long one-story and a basement building shown next. In the basement shown in the bottom picture is a melting tank holding 15 60-pound cans surrounded by a wooden box to hold the heat. The tank is filled with hot water kept hot by a steam pipe from a small boiler, the water reaching to within an inch of the top of the cans. A low fire in the boiler keeps the water hot long enough so that all the honey is liquefied or clear.

Instead of lifting out each of the 60-lb. cans one by one and then turning them upside down over another tank to empty out the honey, Mr. Diehnelt does away with all of that by pumping out the honey from each can. He has attached to the suction hose a half or three-quarter iron pipe, a little longer than sufficient to reach down to the bottom of the can.

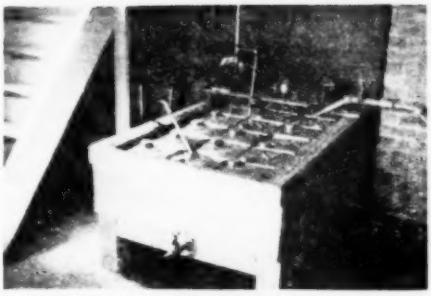


How the cans are pumped dry. One corner is lower than the other three.

A Trick of the Trade Worth Knowing

As the cans are pumped one by one they begin to float or rise, and then tilt to an angle. The pipe nozzle is pushed down into the lowest corner taking out almost every drop. (See diagram cut.) The can rises when nearly empty and tilts to an angle

(Continued on page 662.)



Diehnelt and Rahmlow at the top. Bottom pictures show Diehnelt's apiary and his honey house where he processes honey and makes his honey candy.

National Beekeeping Conference

October 22, 23, 24

Paxton Hotel, Omaha, Nebr.

Convention time, Folks; time for a little vacation and change of scenery and to find out how the other fellow is making it.

Omaha is the place and October 22nd, 23rd, and 24th, the dates, so shake a leg and get that work out of the way so you can head that car towards that part of the country where sweet clover is king.

You have always wanted to meet the fellow who buys your packages and queens up North and he has, no doubt, been wondering on which side you part your hair. Omaha is the place you will meet.

How about that fellow who bought your crop of honey last year? You will undoubtedly meet him at the convention. Maybe you can make a deal for this year's crop when you see him.

You remember some of those swell articles you read in the bee magazines the past year (some maybe not so good according to you), well, come to Omaha, meet the writer and argue it out with him.

At the convention in Omaha, you will personally meet and talk with all the "big shots" (and some not so big) in our industry.

The beginner will rub shoulders with the big producer, and who knows but what maybe the big fellow will learn as much to his advantage as the little fellow does. Every big oak was a little acorn once.

From the Atlantic to the Pacific and from the Gulf up into Canada you will meet them all here in Omaha. Boy, I can hear 'em talking already.

A new feature of the Bee Convention this year will be a really large exhibition by the various bee equipment manufacturers in the country. Here you can meet the folks from whom you buy your equipment and see at first hand their full line of bee equipment and machinery. The response from the manufacturers for exhibition space has been more than surprising, so you will really see everything from A to Z in the equipment line.

The full program is printed below and I wish to tell you that your program committee feel that they have really got together a fine group of speakers and some outstanding entertainment.

The American Honey Producers' League, The Apiary Inspectors of American, The American Honey Institute, and The National Ladies' Auxiliary were all organized to help promote the Honey Industry in America, so come on with your ideas or criticisms and help them to help you.

All aboard for Omaha and a swell time. We'll be seeing you.—R. H. Walstrom, Nat'l. Chairman Local Arrangements and Program Committee, Omaha, Nebraska.

Program

TUESDAY, OCTOBER 22, 1940
Morning Session
AMERICAN HONEY PRODUCERS' LEAGUE
Thomas C. Burleson, Presiding

8:00 to 9:30—Registration—Paxton Hotel, Mezzanine—Get acquainted hour.
9:30—Convention called to order by John Holzerbein, Vice-President; Introduction of Presiding Officer; Invocation by the Rev. A. K. Williams; Addresses of Welcome—Mayor Dan B. Butler of Omaha, Governor R. L. Cochran of Nebraska; Response by Thomas C. Burleson.
10:00—President's Address—Thomas C. Burleson.
10:15—Report of the Secretary-Treasurer, Louis Hines. Appointment of Committees; Announcements.
10:45—Address by L. C. Dadant, American Bee Journal, Hamilton, Illinois.
11:15—Honey Producing Conditions in the Middle West by F. B. Paddock, Iowa State Apiarist, Ames, Iowa.
11:45—Announcements.

NOON RECESS
Scheduled Luncheons

American Honey Producers' League Directors, Paxton Hotel; American Honey Institute Directors, Paxton Hotel; Apiary Inspectors of America, Paxton Hotel; Ladies' Auxiliary Tea, Elks' Club Hotel.

Afternoon Session

2:00—The Uses of Bee Venom in the Treatment of Arthritis and Neuritis, by George W. Ainlay, M. D., Fairbury, Nebraska.
2:30—Federal Marketing Statistics, by Harold J. Clay, Marketing Service, U. S. Dept. of Agriculture, Washington, D. C.
3:00—The Producer's Part in Marketing, by H. H. Root, Medina, Ohio.
3:30—The Honey Market Situation and the Effects of the War on Exporting Honey.
4:00—The Trapping of Pollen and the Feeding of Pollen Substitutes, by Dr. C. L. Farrar, Madison, Wisconsin.
4:30—Progress Report on Disease Resistance, by James I. Hambleton, Bee Culture Laboratory, Beltsville, Maryland.
5:00—Committee Reports and Announcements.
6:00—Apiary Inspectors' Dinner.

Evening Session

8:00—Paxton Hotel Ball Room—Public Invited—Moving Pictures by Thomas Atchison, Montgomery, Alabama. Speaker: James I. Hambleton, Director, U. S. Bee Culture Laboratory, Washington. Subject: Honey Bees in Relation to Farm Crops. Music.

WEDNESDAY, OCTOBER 23, 1940
Morning Session
AMERICAN HONEY INSTITUTE
Lewis W. Parks, Presiding

8:00 to 9:30—Registration—Beekeepers' Friendly Hour.
9:30—Convention called to order by Thomas W. Burleson, Waxahachie, Texas; Introduction of Presiding Officer; President's Address: Lewis W. Parks, Watertown, Wisconsin; Report of the Secretary-Treasurer, M. J. Deyell, Medina, Ohio; Committee Appointments.
10:00—Honey Markets, Past, Present, and Future, by Maurice Dadant, Hamilton, Illinois.
10:30—How to Create a Demand for Honey, by Mrs. Harriett M. Grace, Institute Director, Madison, Wisconsin.
11:00—Recommendation and Classification of Honey for the Bakery Trade, George P. Walton, Bureau of Chemistry and Engineering, Washington, D. C.
11:30—The Honey Package Problem, by a packer of National reputation.

NOON RECESS
Scheduled Lunches

Apiary Inspectors of America, Paxton Hotel.

WEDNESDAY, OCTOBER 23, 1940
Afternoon Session
APIARY INSPECTORS OF AMERICA
H. M. Krebs, Presiding

2:00 Proposed National Bee Law, by James I. Hambleton and aides.
2:45—Discussion on Interstate Shipment of Bees by A. G. Ruggles, State Entomologist, St. Paul, Minnesota, and Thomas Atchison, State Apiarist, Montgomery, Alabama.
3:30—The Meaning of Inspection for Queen Breeders and Package Shippers, by W. E. Anderson, State Entomologist, Baton Rouge, Louisiana.
4:00—The Ports of Entry as a Possible Aid to Apiary Inspection, by R. L. Parker, State Apiarist, Manhattan, Kansas.
4:30—Committee Reports and Announcements.

Afternoon Session
Mezzanine Floor, Paxton Hotel
NATIONAL WOMEN'S AUXILIARY OF AMERICA
Mrs. T. W. Burleson, Waxahachie, Texas, Presiding

2:00 Address by the President.
2:30—Address by Mrs. Harriett M. Grace, Institute Director, Madison, Wisconsin.
3:00—The Uses of Honey in the Home by Mrs. Benjamin Nielsen, Aurora, Nebraska.
3:45—The Value of Women's Work in the Consumption of Honey by Mrs. F. B. Paddock, Ames, Iowa.
4:15—Committee Reports and Announcements.
6:30—Annual Banquet, Music, and Fun—Hotel Paxton.

THURSDAY, October 24, 1940
General Session
Newman I. Lyle, Presiding
President, Iowa Beekeepers' Association

8:00 to 9:30—Registration, Beekeepers' Friendly Hour—Paxton Hotel.
9:30—Convention called to order by President Lyle; Committee Reports; Announcements.
10:00—Production of Extracted Honey, by John G. Jessup, Council Bluffs, Iowa.
10:30—Bee Pasture Problems, by Frank R. Pellett, Atlantic, Iowa.
11:00—New Moving Pictures, taken and shown by H. H. Root, Medina, Ohio.
11:30—Problems of Nectar Secretion, by O. W. Park, Iowa State College, Ames, Iowa.

NOON RECESSS
Scheduled Luncheons

Nebraska—Iowa Luncheon, Paxton Hotel.

Afternoon Session
Ralph W. Barnes, Presiding
President, Nebraska Honey Producers' Association

2:00—Stock Improvement Through Queen Selection, by V. G. Milum, Champaign, Illinois.
2:30—Address by Ralph W. Barnes, Morrill, Nebraska.
3:00—Address by L. M. Gates, State Apiarist, Lincoln, Nebraska.
3:30—Discussion of Local Honey Production Problems by Nebraska and Iowa Beekeepers.
4:00—Final Committee Reports and Announcements.

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Editorials

See page 622 on the origin of the movable frame commonly ascribed to Langstroth.

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Our Cover Page Our cover illustration (by G. A. Pauli) this month shows the open book written by the noted beekeeper, Moses Quinby, a former New York commercial honey producer. It is worth while at times to recall the great benefits which have come to us through the work of those who have gone before. Those familiar with the earlier history of American beekeeping will recall that Quinby wrote a book on beekeeping, the first edition of which appeared in May, 1853. That same month another noted book appeared, also in its first edition, the other book being the celebrated book by L. L. Langstroth, the father of American beekeeping. Quinby wrote his book around the keeping of bees in tall box hives, while Langstroth in his book brought to the attention of beekeepers the benefits of a hive with movable frames. Because of the revolutionary nature of the Langstroth book, less attention was at first given to the equally fine book by Quinby. Not for five years did Quinby come out with a second edition of his book in which he endorsed the principle of movable frames. Quinby then proceeded to put into extensive practice the theory of the new hive and in his day doubtless did more than others to make beekeeping into a real industry. Later the Quinby book went through many editions, the later editions being revised by his son-in-law, L. C. Root. Few books have had a wider or better influence.

When Quinby adopted the modern hive, he made the frames deeper than those used by Langstroth by slightly over two inches, and his hives contained eight frames. The eight-frame hive and the deeper frame are still extensively used, but not in the combination which Quinby devised. The deep frame of today is his chief contribution to our beekeeping of the present.

We think it worth while to pay a brief tribute to the memory of a great and good man, Moses Quinby, who first seems to have visioned the possibility of beekeeping as a profession. May we keep his memory fresh.

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House and Field Bees and a Combination of the Two We usually refer to two kinds of bees in a normal colony; viz. the home, or house bees, and those that go to the fields—fielders, we call them for short.

There is still a third class made up probably of both classes—those that may either go to the fields for nectar, pollen, or water, or that may stay in the hive when honey is coming in faster than it can be ripened by the ordinary force of younger or house bees. Sometimes perhaps the proportion of young and old bees ripening honey or building comb may be much greater than the proportion of bees doing strickly field work.

The Senior Editor has gone through colonies when it seemed to require three-fourths of the total population to take care of what one-fourth of the number brought in.

Dr. Farrar, at Madison, Wis., has been making some observations along these lines and later on we may have some interesting information.

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Sugar Rationed In Europe We are reliably informed that staple foodstuffs including sugar are being rationed all over Europe and even in England. In some parts across the big pond there will be famine.

It is perhaps too much to hope that as the War goes on some way may be found so that surpluses of food in America may get to the starving women and children. There is so much of wishful thinking not founded on fact that one man's guess is as good as another's.

Whether wishful thinking or not, there is not lacking good authority both in this country and Europe that honey is the quickest energy food, and, dollar for dollar, it will go further than beef steak. If this fact were generally believed some way would be found to get nature's only concentrated sweet across the waters that are infested with death-dealing devices.

Feeding Bees Pancakes In our next issue we shall show the construction of the modern pollen trap devised and in use by the bee culture laboratories in various parts of the country. There are certain seasons when nectar is not available, and bees can gather pollen for winter use later on. It is rather surprising that bees can gather **both** pollen and honey in quantity at the same time and when the trap catches two-thirds or three-fourths of what they bring in, they seem to work all the harder to get more pollen so that the reserve in the combs shall be normal.

Yes, bees can bring in pollen by the bushel. This is stored in containers and used later on mixed with soy bean flour. The mixture in the form of pancakes is placed on top of the frames.

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A Problem in Honey Production In some parts of the East and middle West there may be some thin honey this season. This is due, in part at least, to rainy weather that has prevailed recently in some regions. Honey, having an affinity for water, takes on moisture readily when exposed to atmosphere that has a high moisture content.

It is a fact that some beekeepers may remove honey from hives before it is properly ripened or cured. This will result in thin honey that ferments readily.

However, this year, weather conditions were somewhat unusual and unfavorable for keeping white honey separated from dark honeys, especially buckwheat. In some clover localities where buckwheat is grown, it was necessary to remove the clover honey to prevent its becoming mixed with buckwheat. A small amount of dark honey changes the color and flavor of white honey. The clover honey, in some instances, was not properly ripened when the buckwheat honey flow started. This situation presents a problem that is not easily solved. Possibly some ingenious beekeeper will come forward with a solution. It would seem that the best way to avoid such a situation is to keep bees in a locality where buckwheat is not grown. However, during this past season spring rains prevented farmers from sowing normal crops, and buckwheat, which can be planted late in the season, was substituted.

Management of Food Chamber When the food chamber (a super filled with honey to put on the bottom brood chamber for ample winter and spring stores) was first used, it was kept on top of the pile of supers during the honey flow and then placed on the brood chamber in the fall after the surplus honey was removed. The method of handling helped to insure a well-filled brood chamber.

Of late, the food chamber has been left on the bottom brood chamber most of the season—winter and summer—by a number of beekeepers and such an arrangement is called a double brood chamber, the upper chamber serving as both a brood and food chamber. One disadvantage of the latter arrangement is the possibility of the upper brood chamber not being well filled with honey at the beginning of winter, or late in the fall. In regions where fall flows are dependable the bees usually drive the queen down into the lower chamber and fill the upper one with honey. This is ideal for successful wintering.

In regions when there is no fall flow it seems desirable to confine the queen to the lower chamber during late summer and fall months to help insure having the upper chamber crammed full of honey for winter. In some regions the heavy winter loss last winter and early spring was due to an insufficient amount of honey in the upper chamber. During long protracted cold spells the bees reached the top bars and starved because the clusters ran out of honey and could not move laterally or sidewise to get honey that may have been in combs at the sides of the hives.

It pays to have food chambers crammed full of good honey late in the fall so that there is no possibility of starvation.

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The Gospel of Bee Stings and Honey Recently we called at Dr. Bodog Beck's office in New York City at 116 East 58th street where he administers the bee sting cure. See page 492, August, 1938, and page 554, September issue, this year.

As usual he, as well as Dr. Carey, is getting some remarkable results in the way of relief and complete cures for rheumatism and arthritis. Notwithstanding that physicians are taking it up all over the country, he

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expressed impatience that so many of the old line doctors are skeptical.

He, like Dr. R. L. Carey, of Los Angeles, affirm that the commercial bee venom sold for this purpose does not begin to compare in effectiveness with the fresh venom administered by nature's hypodermic needle—the sting.

When he said that the stories in the bee journals of the real bee sting cures reached only beekeepers we reminded him that beekeepers would spread the good news to their family physician and that this in time would overcome the opposition of men higher up in the medical fraternity.

Again, Dr. Beck can not understand why, when the great majority of physicians in Europe recommend honey for the sick and the well alike, that the average doctor in this country is skeptical of its value.

However we assured him that in time, a natural conservatism broken down by facts would change the picture.

The lesson here, Mr. Beekeeper, is for you to help spread the glad tidings of not only the bee sting cure as given in our last issue but the value of honey as a food and medicine.

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Bees Work Certain Varieties of Blossoms Consistently

Near Medina is a large field where early in July both yellow and sweet clover were growing. Frequently, the yellow is nearly gone when the white is in its prime, but because of climatic conditions, and plenty of rainfall this year, both the yellow and the white were blooming luxuriantly at the same time.

In following one bee from blossom to blossom, it became evident that one working on the yellow paid no attention to the white, nor one working on the white to the yellow. Not once, did we see a single bee go from one color to another.

It is well known that bees, working on one variety of flower, seldom change to another variety. It is also well known that bees often show a preference for a certain color. Here were plenty of bees working only on the yellow, and as many only on the white, those on the yellow not going to the white nor those on the white to the yellow.

It was also noticeable that the bees working on the yellow were fairly reveling in the bright yellow pollen —nearly every bee having great loads on the third legs. The pollen from the white sweet clover is of a greenish tinge but none of the bees working on the white showed any pollen on their legs whatsoever. They were evidently getting nectar only, while those working on the yellow were getting mainly pollen.

It is possible that in addition to the difference in the color, the bees working on the yellow variety were chiefly interested in pollen.

One of the most beautiful sights to be seen anywhere is that of a bee poised in mid-air its wings moving so many hundred strokes a second serving merely to keep it in one position. The almost motionless body may be likened to that of a humming bird. With the body motionless, the antennae and legs are all in constant motion. More than beautiful, it is wonderful to watch the bees combing the pollen from the downy hairs on their backs and transferring it by a continuous process to the pollen baskets on their legs. It looks like sleight-of-hand (or sleight-of-foot), but it is all a part of Nature's Great Plan.

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The Backlot Beekeeper

Our industry needs more backlot beekeepers. The backlotter can be, and usually is, a booster for honey. His enthusiasm is contagious. He talks bees and honey in his club, lodge, or church, and builds up a consumer interest in honey. This is needed badly today.

Some years ago the writer sold honey to grocers in some of the midwestern states. Some towns had very few backlot beekeepers and practically no local brands of honey were found on the grocers' shelves. It was difficult to sell honey in those towns, presumably because grocers and their customers were not educated up to the virtues of honey.

Other towns visited had quite a number of local beekeepers who supplied the grocers with honey. Strange as it may seem, it was much easier to sell honey in towns where grocers carried a number of brands of local honey on their shelves than it was to sell in those towns where practically no local brands of honey were found and where there were few backlot beekeepers.

The backlot beekeeper should be encouraged, in order that some of the enormous amount of nectar that goes to waste annually may be saved, also that honey may be popularized.

Just News

Don't forget the Southern States Beekeepers' Federation meeting to be held in Tampa, Florida, November 18-20. More details, also the program, will appear in November Gleanings. Both the Florida and the Georgia state associations will meet at the same time and place.

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THE PASSING OF A. L. BOYDEN

Arthur L. Boyden

A. L. Boyden, 72, a prominent honey man, Secretary of The A. I. Root Co., Medina, for many years, and later President of the A. L. Boyden Co., Alhambra, Calif., died at the Huntington Memorial Hospital, Pasadena, on Sept. 10th, shortly following an operation.

In 1896 he entered the employ of The A. I. Root Co., as a stenographer. He gradually worked his way up in the organization until he became Secretary and Sales Manager and Advertising Manager of Gleanings in Bee Culture. Always a lover of bees, his special hobby was honey and its exploitation.

In 1921, he and his brother L. W. Boyden, then Factory Superintendent of The A. I. Root Co., took over the business of the Root Co. on the Coast and organized the A. L. Boyden Co., at Alhambra.

Both at Medina and later in Alhambra he became active in various civic affairs.

He was President of the Medina School Board for a number of years, and a member of the Congregational Church.

Later in Alhambra he served as a member of the City Planning Association, was President of the Chamber of Commerce, and a member for a number of years of its Board of Directors.

Mr. A. L. Boyden, with failing health, retired some six years ago living a quiet life at 2117 Orange St., Alhambra.

He leaves a wife, who was the daughter of A. I. Root, two sons and a daughter in California. He and his brother, L. W., were known from one end to the other of California as honey and bee supply men.

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The Sandwich Islands Honey Co., Ltd., of Honolulu, owned by Mrs. Olivia St. John Gilbert, was recently sold to a newly-organized firm known as the Hawaiian Honey Co. The honey ranch includes about 20 acres, in Ewa, has 2500 colonies of bees.—From the Honolulu Star Bulletin.

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The Georgia Beekeepers' Association will hold a Honey Show during the week of November 4th, at Sears, Roebuck & Co. Farmers' Market, Atlanta, Ga. Each beekeeper is asked to send a 5-lb. pail of each variety of honey a week before the show begins. Sears, Roebuck & Co. will pay for it or sell it and give the beekeeper the returns. Georgia Beekeepers' Association will hold a one-day business meeting at the Honey Show Nov. 7. Some very important changes are advocated in the state inspection laws. All beekeepers of Georgia are urged to attend.—C. H. Herndon, Sec.

(Continued on page 661)

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"It is better to debate a question without settling it than to settle it without debate".---Joseph Joubert

Symposium on Wintering

By E. R. Root

Divergent Views Analyzed and Harmonized

Whether There is a Sub-zero Temperature and If So the Duration of it, the Amount of Moisture in the Atmosphere, the Velocity of the Wind and the Question of Wind-breaks—All These Conditions and Many Others Have a Bearing on the Question

[In this discussion we are reminded of what Josh Billings said, "What's the use of knowin' so much when so much you know ain't so". The writer has admitted from the platform and in these pages that twenty years ago he knew or thought he knew all about wintering. It is only fair to say that today he is less sure of it after interviewing leading beekeepers and scientists from all over the country, and also after reading hundreds of letters, a few of which are here given.

While we do not minimize the value of packing and that it is helpful under some conditions as will be pointed out, its importance has sometimes been over-estimated in comparison with other factors that are vital.

More stress should be put on the condition of the colony, its size, the age of the bees, and the quantity and quality of food.

As Jas. Hambleton, the head of the Bee Culture Laboratory in this country, has said, "that a little more stress could be given to the importance of having a good, healthy, vigorous animal to start with. Only mediocre results can be expected when under-nourished grade animals are used no matter how well they may be housed and fed".

It will be noticed that we give the more radical views first, those which seem to knock the very bottom from the old orthodoxy of wintering. Following these are statements less radical or that tend to harmonize differences of opinions. We finally close the symposium with the opinions that more nearly conform to the old orthodoxy and at the same time show perhaps that the problem of wintering is based on locality, climate, moisture within and without the hive, and temperature as modified by insulation. While there is apparent confusion and conflict in statements, yet if we analyze the facts of nature carefully and put them in right relation to each other we may see that there is really no conflict. We attempt to show this in the summary at the close.]

WINTERING IN SINGLE-WALLED HIVES

[The following is taken from The Scottish Beekeeeper of March, 1940.]

I have read most of the literature published in America and other places about this subject, and I know all the patter very well; but the difficulty I have always run up against is that when I have tried to test it in practice wintering, according to these theories, has been less successful than when far less elaborate care has been taken. I have, therefore, arrived at the dreadful conclusion that all this packing bees, critical temperatures, etc., which we have all heard so much about, is more or less what Henry Ford declares history to be—"Bunk".

How do I know? Well, I don't know. **But I have found that my bees do better when left unpacked in single-walled hives, and I have tried, I really believe, almost every conceivable form of packing. I made a number of the four-colony winter cases. The bees in them always wintered worse than those left unprotected in single-walled hives.** I bought ten of those awful American double-walled hives. **I cannot recall that I ever had a decent stock come through in one of them until I threw away the packing trays and left the top unprotected, which is equivalent to doing away with packing entirely, of course.** I tried wrapping in straw covered with felt or sisalkraft, and sacks covered with the same. I tried felt and sisalkraft without any other protection. All these plans were persevered in for years, and now all my bees are left in completely unprotected single-walled hives.

Now it is a curious comment on this heavy packing idea that a cold winter, such as we are now experiencing, nearly always precedes a good spring come-out.

There ought to be something in the packing idea; but "facts is stubborn things, not easy drove", as Mrs. Gamp said. And I think that there are two essentials to good wintering that are not enough emphasized. **One**

is that of keeping hives dry, or, at all events, having them so arranged that they dry quickly again should condensation occur in them. The other is healthy young bees, and enough of these. A third, but more obvious point is that there shall be the right food in sufficient quantity.

And a lot of beekeepers will forget one important item in this last. Honey or sugar they provide; but how many don't bother about having plenty of pollen in their hives? Bees cannot rear brood properly without it, and without early brood-rearing a stock stands great risk of dwindling in spring. Our American colleagues used to make great play with the theory that winter brood-rearing is a bad thing for the stocks. I notice that they are now gently unhooking themselves from this position, by the way.

Dr. Phillips explained to me orally, when he was in England, just how he considered the matter stood. He thought that bees created the necessary heat to maintain the cluster temperature by great activity which entailed the combustion of heat-producing food through muscular action, and thus packing, by insulating the bee cluster, assisted in maintaining even cluster-temperature, thus relieving the bees of the necessity of muscular activity and food consumption.

Well, I tried it; and the bees in the 4-colony packed cases were always more active during the whole winter, and they wintered much less satisfactorily. So I had enough of that.

Now consider. In cold weather a large colony of bees will of course cluster; but the colder it is the smaller the cluster becomes. We can see enough in five minutes, without disturbing the bees at all, to satisfy ourselves of this. How enormous is this contraction is almost incredible, but the result is that sufficient warmth is held and slowly radiated out from the centre to keep the bees alive. **We are told of bees moving violently and even fanning with their wings in the centres of these tight clusters. I don't believe a word of it. It is not physically possible, and I only believe in possibilities.**

All that happens when you pack heavily is that the bees cluster less closely, I believe, and results seem to show that this does them no particular good. Why should it?

Then we are regaled with the magic temperature of 57° F. But bees are flying freely at much lower temperatures than that at any time of the year. What do they mean by "clustering" exactly?

When winter temperatures are to be faced that fall far below zero for a long time, why then something must be done to assist the bees. But the point is that these very low temperatures injure the bees little, if at all *per se*; what they do is prevent the bees from moving as a body in order to feed. Bees that can get nothing to eat will starve, like the best of us; and if they are held immobilised in one place they can only reach a certain amount of food and when that is gone they starve—starve just the same when there is plenty of food an inch or two away. For food out of reach is of no use to them.

In no part of these Islands do we ever experience weather that will do any harm worth mentioning to well-found stocks of healthy bees, so why do a lot of packing which is entirely unnecessary? **And it is quite a question whether packing may not even be injurious in many cases in temperate climates like ours.** When we are having a cold spell, like January, 1940, there will be short periods when the sun shines. Now a very little sun shining on a single-walled hive in a sheltered spot, especially if **the hive be not white, will enable the cluster to move and resettle, which is most of what is needed; for bees can do without a flight for a good long spell without harm,** if they are healthy, of course.

So beekeepers should think before investing their money in packed double-walled hives or winter cases. Hives cost enough, in all conscience, when they are single-walled; but the cost of most of the quite unnecessary hives marketed in this country is such as to take a large slice from profit, if any.

Again, it is common belief that very large clusters are an advantage. I am very doubtful even about this. I used to take it for granted, but now I don't think so. A medium-sized cluster of mainly young bees in a single-walled hive which is dry (preferably not painted), and supplied with well-stored food, both honey and pollen, will usually winter quite as well as a very large one.

R. O. B. MANLEY,
Benson, Oxford, England.

Note.—Emphasis is ours.—E. R. Root.

IN SYMPATHY WITH MR. MANLEY

I am in hearty sympathy with the most of what Mr. Manley says about packing bees. Experience and reports convince me that where flights may be expected at frequent intervals it is only necessary to contract entrances and of course provide the fundamental internal hive requirements of young bees and adequate stores. Just how far north it is advisable to dispense with packing I would not say, but I would say at least to the Mason and Dixon line in the U. S. A.

Where confinement extends into several months it is no doubt advisable to use some insulation more than an inch of pine or cedar. I have never tried top entrances but after disastrous experiences with deep snow of late years I feel that they would at least be a good safety-valve to prevent smothering.

Importance of Wind Shelter

Protection from wind I have left to the last as it is worthy a separate paragraph. Certainly all through the North and probably in the Southern states some wind shelter is helpful, not always but often very valuable. I am thinking now of a beautiful queen yard where over a thousand mating boxes, all painted white sit in even rows showing straight lines from every angle. A thing of beauty but not very joyful when incessant winds ripped over the area day after day last spring, days on end when virgin queens expected to bring good money, dared not venture out to mate, or if they did they never returned. How we longed for some sort of wind shelter even though it was the active season and the calendar showed that it should be mild and beautiful for nuptial flights.

MORLEY PETTIT,
Tifton, Georgia.

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HOW OPENINGS ALLOW THE MOISTURE TO ESCAPE FROM HIVES IN A BARN

The past four years I have given each colony twenty absolutely perfect combs. Of course, I requeen each fall, or oftener if a queen fails. I give abundance of ventilation according to the season and strength of the colony; two-inch bottoms or jack the hives up on blocks one to two inches thick, and, in extreme hot spells, I have taken the entire top off for a few days. I keep my bees in a barn.

I haven't had a swarm in four years, and last year the bee inspector said my colonies had more honey in the supers than any other colonies he had examined that season. One colony from which increase was made produced 432 pounds.

Orthodoxy of Wintering but Mold and Dampness

For years I followed the usual method of winter packing with lots of hay and tar paper, the tops on tight and the bottom entrances reduced to about 8x⅜ inches to be mouse proof. I always had lots of mold and dead bees clogging the bottoms. I was told by one of the highest beekeeping authorities in America that if enough packing was used there would be no moisture in the hives, and to be sure to not disturb the tightly sealed covers on top. Accordingly, I carefully wrapped many thicknesses of tar paper about the hives, snugly secured this to the entire hive with tacks and string, applied some old carpets, rugs and fur coats and buried them deeply in hay —this in a second floor of a barn where they could fly out. The colonies were very strong and the tops sealed on.

May first came and warm. I unpacked them and the paint stripped from the hives like so much oilcloth, and the water ran down the sides of the hive from blisters several inches across. The combs were so moldy you couldn't tell them from pieces of rotten plank. I burned many of them. All colonies were alive and did well that summer.

Last year I packed fairly strong two-story colonies by sliding the tops back about three inches and applying four thicknesses of loose potato sacks and several inches of hay over the tops and around the hives. The bottoms were left with a full width entrance but reduced to one-fourth inch. Along in February I thought of mice! I opened them and did not find a particle of moisture or mold, but reduced the top opening to a mouse-proof crack across the back end of the frames. I again applied the burlap and hay. On May first, I closed the tops and there is no mold in sight. We had two partial flights only here from November to the last week in March; just a little spotting was then noticed, and this quickly disappeared. Since bees are so smart, why don't they refuse to seal up a corner

or a side of the top and come through dry and happy?

REV. J. E. McKEE,
Alpine, N. Y.

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DISCARDED PACKING, UPPER ENTRANCE IMPORTANT IN SOUTHERN OHIO

If we sum up what we really know of the needs of our bees for successful wintering we find it is not very much. Young bees, food (honey and pollen), proper ventilation, plus wind protection will fairly well sum up our knowledge.

When I came North into Ohio some dozen years ago from Puerto Rico I tried several methods of wintering in the same yards. Some were packed in six to eight inches of sawdust, others wrapped in building paper and in double and single walled hives. Over a series of years the results showed one year the packed would make the best showing, and probably the next year the unpacked would be far superior. The colonies in single-walled hives would be stronger and have but little loss. This went on for nine years. The past four years I have used no protection other than natural windbreaks. Practically all colonies are wintered in either one and a half or two storied hives.

Last fall, 1939, I was incapacitated and for the first time in my life was unable to get my bees ready for winter. The fall was very dry and little brood was raised resulting in small winter clusters having insufficient pollen stores and not any too much honey. I lost better than three out of five colonies.

In the past four years I have experimented with an upper entrance and have been sold on this as one of the requirements for successful wintering in the Ohio clover belt. By this I mean having the normal winter entrance plus a half-inch hole in the upper story. This results in a dryer hive and also gives a more direct entrance for the bees to leave the hive.

In going over the surviving colonies this spring I found every one had an upper as well as lower entrance. Also they had an air space of at least an inch below the bottom-board for air circulation.

Importance of Air Drainage

The location of an apiary may play a leading part in the survival of the colonies in a long-drawn-out zero or near-zero spell as we had last winter. If we watch in the fall we can note that the frosts follow a general trend which I believe are caused by the currents of flowing air. If an apiary is located in what I call a low air pocket there is almost no air circulation. This condition in long cold winters will always result in heavy winter loss. My experience has been that bees will winter better if the apiary can be placed on a slope or a hillside in preference to the lower ground.

There are probably factors which enter into successful wintering of bees of which we know nothing. In going over the winter-killed colonies this spring I repeatedly came across hives which had two, three, and four small clusters of bees located almost any place on the combs with no signs of dysentery. Why did they cluster separate in this manner?

Many of the colonies did show the results of dysentery, both the surviving colonies and those dead. Also possibly ten percent died from starvation, having consumed the honey at hand and not being able to shift on account of the cold.

My future winter requisites will be as follows: A young queen in a one and a half or two storied hive; upper and lower entrance; bottom raised at least an inch above the ground level for air circulation; apiary located on a slope where possible with water nearby. Then I will hope to have enough natural stimulation to produce young bees for the winter cluster and a reserve of pollen. Honey stores will be taken care of in normal years.

PENN G. SNYDER,
Trotwood, Ohio.

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PACKING IN THE NORTHWEST ALL BUT GIVEN UP

Here in the West we have all but given up packing. Moisture in the hives is a serious problem, particularly on the west side of Oregon, and I am inclined to think that our poor wintering conditions on the west side of Oregon are due, in a large measure, to the insufficient pollen and the fact that pollen molds so freely from the excessive moisture. As you probably know, bees winter much more successfully in Eastern Oregon where they are not troubled to the same extent with moisture and they also have, in most cases, a much more liberal supply of pollen.

The whole problem of wintering calls for careful study in the various types of climate. However, it is un-

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doubtedly true that with ideal conditions present, whatever those ideal conditions are, bees will winter successfully in all climates.

H. A. SCULLEN,
Associate Professor of Entomology,
Corvallis, Oregon.

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SUCCESSFUL WINTERING IN BOTH CELLAR AND OUTDOORS

Some 35 years ago I endeavored to winter bees outside in single-story hives. The results were far from satisfactory. Since that time I have followed cellar wintering of 100 to 400 colonies with very few losses. Last year, as a sort of experiment, outside wintering in double brood chambers was tried with 15 colonies, the remainder being placed in the cellar as formerly.

All colonies were strong and had young queens and adequate supplies of honey and pollen. As it was desired to reduce the number, 30 colonies were doubled to make up the 15 carried over. The hives were wrapped with thin tar paper brought down to the ground to keep the wind from blowing underneath and folded over the top and weighted down. This served as a protection against weathering of hives as well as protection for the bees. A ⅜x3-inch opening was left both at the top of the hive and at the bottom entrance so that a circulation of air could carry off any surplus moisture, thus preventing condensation. The yard was well protected by woods on three sides and open to sunlight on the south.

As to results: All hives were dry and clean and there were no winter losses either of those in the cellar or outside, but the outside bees came through exceedingly strong. Evidently they had been rearing brood in winter and early spring as they had several combs of brood at the time the cellared bees were taken out on March 19. Inside wintered bees ordinarily do not start brood-rearing until taken from the cellar, and here is where the outsiders had the start. The cellared colonies built up to full strength about June 1 and were Demareed, thus doing away with practically all swarming, but the outside colonies were a problem. With double brood chamber and two extra supers they were ready to swarm at the beginning of fruit bloom. Most of them started swarm cells at that time and the others shortly afterward notwithstanding the sections of the brood chamber were reversed, that is, the upper one placed below. Of course, these colonies could have been divided, but with already too many colonies, it seemed to be a case of Demareeing, picking queen cells, or letting them take to the tall timber which, no doubt, many of them did. By the time the clover flow came on there was not much difference in strength between these and the cellared bees.

The Modern Orthodoxy of Good Wintering

I am not posing as an authority on outside wintering but, judging from limited experience in this matter, it would seem:

1. That yard protection is of primary importance, enabling bees to fly on warm days when those more exposed would be unable to do so.
2. That the double brood chamber for wintering is to be preferred, the food above being more easily reached by the bees than if placed at the side as in the single-story hive.
3. That a small opening both above and below allows a passage of air, thus carrying off moisture which otherwise would condense.
4. That tar paper affords a protection against wind and rain and at the same time allows penetration of the sun's heat when a thick insulation would not, thus giving the bees an opportunity to change position in the hive and to fly on moderately warm days.
5. That hives may be wrapped singly on summer stands, saving labor.
6. That it doesn't pay to try to winter weak colonies or those short of stores.
7. That apparently strong colonies do a considerable amount of brood-rearing in winter and early spring, giving them an early start.
8. That colonies made strong in the fall by doubling and with adequate stores of honey and pollen may, in spring, be strong enough to divide, with less liability to winter and spring losses.
9. That the double brood chamber is no insurance against swarming.
10. That unless divided, such strong colonies in early spring may be less desirable than those that develop later and acquire maximum strength just in time for the honey flow.

E. S. MILLER,
Valparaiso, Indiana.

WINTERING IN SINGLE THICKNESS MOISTURE PAPER

For the past 12 years we have been wintering our bees outdoors with a roofing paper wrapper. We have had no loss attributable to this method of wintering, though occasionally we have lost a colony from starvation—which, of course, is our fault.

Winter temperatures vary somewhat in Madison, but we have had winters when the temperature went from 20 to 30 below zero, but as a rule 20 below is about the coldest. For the past few years we have wintered over 100 colonies in this way and we are quite satisfied with the method.

We, of course, believe in wintering in two 10-frame hive bodies because we feel that a single 10-frame hive body will not hold enough honey and pollen to carry a strong colony through until the next year's honey flow. We believe that every strong colony should have about 50 pounds of stores plus the equivalent of two or three frames of pollen.

We started in about ten years ago using common tar paper wrapping. We tried three or four different brands and qualities of material. In two or three years they were all used up—worn out. At the same time we wrapped some in medium weight roofing paper. This material with careful handling is still in good condition, after ten year's of use.

The U. S. Forest Products Laboratory in Madison told us that the ordinary kind of tar papers were neither moisture proof nor air proof and that a paper with asphalt impregnation was the only type which kept out the wind and the moisture. This fact, together with its durability, led us to believe that roofing paper would be the cheapest in the long run.

We believe that what is on the inside of the hive is far more important than what we place on the outside. A weak colony in the fall will not come out a strong colony in the spring. A strong colony in the fall with pollen available for February and March will produce young bees during those months and come out strong in the spring.

We believe that a windbreak is quite essential and always locate our apiaries where there is a windbreak on the north and northwest.

Top Entrances

After several years of trial, we found no special advantage in a top entrance and so have discarded it. We do, however, have a one-inch piece of insulation board nailed inside of the telescope cover to give additional protection on top of the cluster.

We leave the bottom-board with the deep side up the same as in summer so that our entrance—about two inches in width—will not become clogged with ice. Of course, we must protect against mice by covering the entrance with a wire screen.

Last year we tried wintering a few colonies in each yard with a ¾-inch auger hole just below the hand hold in the front of the upper hive-body. This gives some ventilation and of course is a safety factor in case the lower entrance becomes clogged.

An outyard of H. J. Rahmlow & Son, Madison, Wis. Colonies wrapped in 2-ply roofing paper with 1 inch sheet of Celotex inside the telescope cover.

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It works satisfactorily and we may increase the number of colonies so wintered.

We believe that the roofing paper wrapper has the advantage of absorbing the sun's rays and warming the hive on sunny days when the temperature may be relatively low. On days when there is a short flight period it would also warm up the colonies enough so that they would have a maximum opportunity of obtaining a cleansing flight.

This method is inexpensive, saves labor, and quite satisfactory from our standpoint.

We think it is a mistake for any beekeeper to switch from one method of doing things to another suddenly, unless his own method is quite unsatisfactory. We have seen too many try a new method which worked well for someone else, with bad results in the beginning. Make changes slowly and with care.

H. J. RAHMLOW,
Madison, Wisconsin.

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WINTER LOSSES DUE TO PREVIOUS FALL

We have noticed that wherever the bees have been confined with rather small entrances and they have died and disappeared, their combs are very wet, which is quite evident that the condensation of moisture in the form of frost during the colder part of the winter thawed and dropped down over the bees and then another drop in temperature literally froze them. I am still of the opinion, and more convinced than ever, that the bees require adequate ventilation in the winter as well as in the summer. Many of those old box hives which are thoroughly ventilated from all angles seem to be the stronger colonies at this time.

Colony strength of those which succeeded in coming through the winter is at a very low point, and the lowest I have ever seen it at this time of the year. Where the bees have been given a boost with a couple of pounds of bees from the South, they are coming along in splendid shape and will be just about at their peak when the clover flow makes its appearance.

Importance of Top Entrance

Top entrances, if not too large, with wide open bottom entrances serve the purpose of eliminating the moisture in the hive. We have some reports from some of the beekeepers who have wintered their bees under this plan in Northwestern Ohio, which are coming through in excellent shape, while others in the same vicinity stuck to the old conventional methods and lost very heavily (more than 50%) and the remaining bees are very weak.

CHAS. A. REESE,
State Bee Inspector,
Columbus, Ohio.

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THE ENORMOUS COST OF WINTER LOSSES

There are approximately 300,000 colonies of bees in the State of Ohio. In a talk with Charles Reese and Dr. Dunham we decided that the loss over the state for the winter would average 50% or 150,000 colonies. If these were all replaced with package bees at an average cost of $2.50 per colony it would reach the appalling amount of $375,000.00. In addition to this the honey they consumed, before they passed out, and the labor involved in getting the yards back up to par would amount to at least $125,000.00 more. This means that the beekeepers of the State of Ohio this spring suffered a loss of one-half million dollars. Many commercial yards were not put back up to par and this will mean another staggering amount for honey which might have been gathered. In nearly every business one loss invites another loss. How many beekeepers will endeavor to get at the base of this loss in order to prevent a similar one in the future?

Winter Losses Due to the Previous Fall

I think that Charles Reese hit the nail on the head when he mentioned the fact that our winter losses happened back in August and September. From now on we are watching our brood more closely during these two months and if the brood is nil we are gassing them and extracting the honey which they would have received for winter food. This honey will almost replace them in the spring. Better take a partial loss early as a big one later.

Insulation Values

Packing for security over winter I believe is almost past history. I do believe in an insulation on top and bottom of each colony in both summer and winter. This I have done with every colony I have. I have talked with a number of people who were well abreast of the insulating

business. In a magazine put out by the American Association of Insulating Engineers I found this and I quote: "One-half inch of good insulating material will give 24% insulation. To double this percentage or 48% insulation it would require 18 times the thickness or 9 inches". Insofar as packing goes I agree with our English friend, R. O. B. Manley, and I also agree with him in many other points he has suggested.

Moisture from Within Causing Paint to Peel

Here is what I have found out in painting: It is not an uncommon thing for the paint to peel from the brood chamber. I have discovered that this is nearly always caused by the moisture from within penetrating through the $\frac{13}{16}$" wall. To avoid this all hive bodies are given a good coat of boiled linseed oil with a little dryer in it. This is put on with a spray gun at 45 pounds pressure. Then apply your paint and it will stay until the elements wear it out. As to colors, red and black absorb the heat and white and aluminum reflect it off. An unpainted brood-chamber might work out fine. I have never tried it.

Importance of Air Conditioning of a Hive

There is one thing that has been given very little if any attention or consideration by beekeepers. That one thing is AIR CONDITIONING THE HIVE AT ALL TIMES OF YEAR. During the honey flow if the air conditioning is right there will be less moisture content in the honey when it is extracted. During the winter months bees will do much better if the air is free from moisture. Bees cluster to the top of the brood-chamber. Humid air is lighter than dry air so that the air containing the most moisture is always around your cluster of bees at a time when they need the dry air the most. This air conditioning will have to be done without causing a draft on the cluster of bees.

W. A. COULTER,
Columbus, Ohio.

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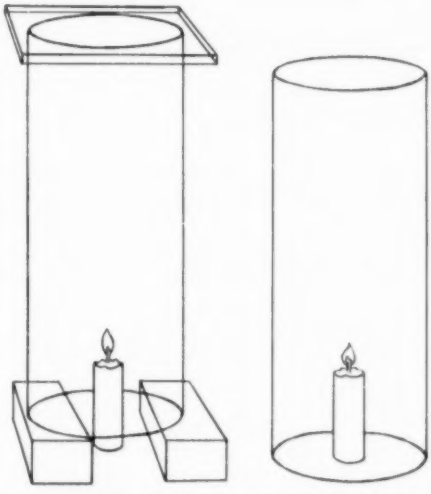
THE THEORY OF TOP ENTRANCES EXPLAINED

I have never purposely wintered any bees with top entrances, though I have many times been surprised that bees often winter better in old worn-out leaky hives while similar stocks die in perfectly good weather-proof ones. More surprising still is the well-known fact that the tiny straw hive so common in all English villages a few decades ago brought its bees through the most trying winters with wonderful regularity although I doubt whether it held enough bees to make a good 4-frame nucleus of modern times.

Although I freely confess to having had no experience with top entrances, I think I can convince the most hardened sceptic that such are correct and that the usual lower entrance is incorrect—by a very simple experiment.

Like all other forms of animate life, bees inhale oxygen and exhale the heavier gas carbon dioxide. Although carbon dioxide is heavier than oxygen it is not heavier than atmospheric air when it first leaves the bee, on the contrary, it is **lighter** by reason of its warmth. The foul exhalations of a hive therefore would readily escape upwards if allowed to, taking with them the moisture inseparable from the act of breathing and it is seemingly this moisture that causes most of the trouble in a badly wintering hive. In the lower entrance hive this carbon dioxide can only escape out of the entrance after it has cooled down to the average hive temperature and it is this cooling down that condenses the moisture it contains and deposits it on the hive walls and on unoccu-



Bottom ventilation only. The candle is extinguished.

Upper ventilation only. The candle continues to burn.

pied combs with detrimental results. At the same time the bees are probably deprived of a sufficiency of fresh air because of the slow exit of the foul gases that must escape before their place can be taken by air from outside.

This whole process can be illustrated in a very striking manner by burning a small candle in a glass tube, closed at the top, to simulate the sealed inner cover and raised half an inch at the bottom to represent the lower hive entrance. Within about one minute the candle flame languishes and expires. It is starved of oxygen and although ample space is left around the bottom of the tube to admit more air it cannot reach the flame because the heavier carbon dioxide is at the moment too warm to descend and escape, and so monopolizes the closed space. A very different result follows if the candle is lighted in a tube closed at the bottom and open at the top, similar to the ventilation of a top entrance hive. In this case, the hot gas rushes out because it is warmer than the air around it and atmospheric air is forced to enter and take its place and so nourishes the flame.

The chemical exchange of gases in the candle flame and in the breathing of living creatures is almost exactly analogous except that the flame "lives" more quickly and so exhibits the process of events in a more striking way.

C. L. N. PEARSON,
Vernham Dean, Hants, England.

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IN FAVOR OF UPPER ENTRANCE

I am not well enough versed to discuss the merits or demerits on the top entrance during winter months, but I would like to put forth my own experiments in wintering. The first winter I had only one hive and this I wintered in one full-depth hive which I wrapped in several old awnings. They survived the winter but came out in the spring very weak. The top of the frames were covered with mold, and the inner cover was warped hoop-shaped. Having read of other methods of wintering during the summer, the following winter I thought I would try a new way so I made a wood box and put the bees in the box surrounded with sawdust. They barely wintered through again. The same condition of moldy frames and warped inner cover existed in the spring. Not being satisfied with either of these methods of packing, the next year I tried tarpaper and sawdust packing with the same results. The fourth year I used leaves in place of sawdust, and this was less troublesome to handle, but still didn't do away with the moldy frames.

Having read the various discussions on top entrances, packings, etc., and with my outlook poor I thought I would again experiment. I packed four hives consisting of two full-depth supers each side to side, and these in turn I insulated with corrugated pasteboard which I obtained from empty packing cases given to me by a grocer. The small wooden pieces of sections, which cover the hole used for the bee escape I replaced with a piece of screen wire the same size, and this in turn was wrapped with cheesecloth about four times. I then wrapped the four hives with the cheapest grade of tar paper obtainable. I used only a bottom-entrance with the one-inch modified opening that comes with each Root hive. Much to my surprise when I unpacked the hives the first part of April I found they had all survived in good condition and three of them had from two to three frames of sealed brood while the fourth hive was queenless but still strong. What impressed me most was the absence of mold on the frames, lack of condensation on the inner cover, and its not being warped this spring. Having had such a severe winter, such poor stores, and on several occasions the inability to take a cleansing flight for two to three weeks at a time, I feel this is a very good test for this method.

U. F. ABBS,
Pittsburgh, Pa.

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IMPORTANCE OF GOOD STORES AND UPWARD VENTILATION FOR COLD CLIMATES

First of all, it must be remembered that over the greater part of Canada the winters are usually long and severe where temperatures of thirty to forty degrees below zero are quite common, and in some places it may drop even lower than that. Furthermore, extreme variations in temperature may occur within a very few hours, all of which is very hard on bee life unless properly prepared for it.

Both cellar and outdoor wintering are widely practiced throughout the

Dominion but there is no doubt that other things being equal cellar wintering is the safer, but unfortunately too many of the cellars used are entirely unfit for that purpose, hence considerable loss occurs in them.

No matter if the bees are wintered in cellars or outside in packing cases, I am firmly convinced that a great deal of the loss could be avoided if a little more care were given the colonies when preparing them for the winter. Too many colonies die in the early spring, simply because the food given in the fall was not quite sufficient to carry the bees through until new supplies were available. Many more perish or become seriously weakened because in addition to being insufficient, the food was of doubtful quality or the colonies were over-populated with old bees. A good queen, young bees and a liberal supply of wholesome food, including pollen are three essentials for successful wintering, and unless these are provided losses are bound to occur no matter how or where the bees are wintered.

Some Packing Needed

The question of protection is an important one and no matter whether the bees are to be wintered in cellars or in packing cases, two important factors closely related, must be taken into consideration—ventilation and escape of moisture. These factors can be more easily controlled in a good cellar than in packing cases outside. Although I do not think outdoor wintered bees need so much packing material as commonly used, some of it is needed in Canada and regions with a similar climate, but any such protection is worse than useless if it becomes wet and frozen. It is not sufficient to make provision for the removal of moisture from the colony itself, but it must also be carried beyond the packing, and I believe that is why the top entrance is attracting so much attention for it does that very thing.

For outdoor wintered bees I feel that protection from cold driving winds is also important, the loss or weakening of colonies is usually much heavier in bleak open places than it is in well sheltered yards.

C. B. GOODERHAM,
Dominion Apiarist,
Ottawa, Canada.

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IMPORTANCE OF A SUFFICIENT NUMBER OF BEES

The difficulty with deciding what is best in cases of this kind is that even on experimental evidence no two writers may have the same conditions that the other writer is discussing. I always like to go back to the fundamental basis of the requirements for bees under natural conditions. My whole experience indicates that if you have a sufficient number of bees to maintain the temperature through the cold weather and that if the bees have first-class stores, they manage to survive under the most severe conditions. Therefore, it seems to be more a condition of the bees and the food supply.

Packing or No Packing

Protection through the winter months probably is important as we have found by experiments here at Madison. Where the unprotected colony used in the neighborhood of 30 pounds of stores, the protected colony used only 12. But the difficulty comes, I think, in the spring. If the bees are kept with heavy packing the colony is almost sure to deteriorate. If the bees have no packing they seem to improve. There must be considerable difference between ranges of climate. In northern Wisconsin where the bees are kept within the hive by cold weather throughout the winter, the bees usually winter better than they do in the vicinity of Madison where the temperatures in winter vary at times, causing the bees to become excited and either start rearing brood or to try to do so. The amount that they can raise is dependent, of course, on the amount of pollen present. So I still feel that too much packing is undesirable if it is left on past the middle of March or first of April.

H. F. WILSON,
In charge Dept. of Economic Entomology,
Madison, Wisconsin.

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FOOD IN QUANTITY AND QUALITY SHOULD BE PROPERLY PLACED

To see with one's own eyes the hives in which colonies have died in winter or spring makes it easier to give a correct diagnosis, but to give a diagnosis through information in a letter is far more difficult.

Most apiaries the past winter and spring here in Connecticut have been in fine shape, but occasionally there was an apiary that suffered. In my own apiaries two suffered from being so deeply buried under drifts in a late snowstorm—drifts so deep that

bees suffered from lack of flights before the snow had melted away to make flying safe.

Also here in the East the bad weather of late spring prevented nectar-gathering with the result that some apiaries have become badly depleted through little brood-rearing.

In my observations during the past 56 years I have found three chief causes for bad wintering. First of all I should place the onus on stores—both as to amount and position, to say nothing of bad food such as honey-dew. Not only should there be a sufficiency of good stores, but it is highly essential that these stores should be massed in such a way that the colony cluster can have access to food for three long months. A hive may have 25 pounds of stores placed as follows,—each outside comb nearly solid with honey, the corners and upper half of the next combs, while the remaining six combs may have perhaps two to three pounds strung along the top-bars. Now in such a hive the bees cannot cluster so as to have honey for three months. Any beekeeper who tries to winter bees when that condition prevails is taking a great risk. If the winter is mild with occasional flights he may get by, but if the winter is prolonged with no flights then he will find nearly every colony dead in March.

If all the combs have at least four inches of honey sealed in the upper parts then the chances for the winter are very fair even if it be a cold winter.

Now it usually happens that a shortage of stores is accompanied by a poor proportion of bees. By this I mean that there is too large a proportion of either old bees or of very young bees.

August may be such a poor month that little breeding prevails throughout that month and early September. Then comes a fall flow and much brood is reared. The result is that when winter comes there are no old bees at all, few middle-aged bees and a host of young bees. Now it is very difficult for young bees to winter. They go into winter often overloaded with pollen refuse, not getting thorough cleansing flights in late fall. In winter flights these bees are often lost being so heavy that they fall to the snow. Those bees which winter best are bees from two weeks to three weeks of age. I have often spoken of control bees. This is the golden age of the bee and no matter what problems come upon the hive these bees always meet that problem better than either old or young bees. These bees are strong and in winter flights seldom lost and they are naturally more active and will bring about the proper movement of the cluster in winter so that new stores become available.

As I see what happened in the Middle West last winter and this last spring it must have been a combination of insufficient stores plus a deficiency of control bees. Spring came with either the colony dead or much depleted. In that depleted condition there was no colony morale, no pick-up. Weakened young bees by bad winter conditions will never have much pick-up in spring and such colonies easily become a prey to strong colonies and soon are robbed out if they do not peter out of themselves.

The answer then to the problem confronting us is this: The beekeeper must be on the alert. In late summer if brood-rearing falls off to a dangerous point he must feed each colony a gallon or so of thin syrup. If the fall flow fails he must feed two gallons of thick syrup. It mounts into money and if he cannot see his way clear to do this he must kill off his colonies which will not winter and buy package bees the next spring.

In a word—if Nature does not prepare colonies for winter so that they are normally fit to meet the hazards of winter, then the beekeeper must do that or suffer a loss.

ALLEN LATHAM,
Norwichtown, Conn.

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RELATIONSHIP OF ATMOSPHERIC MOISTURE TO TEMPERATURE

It is my feeling that most of the trouble and confusion is due to the lack of appreciation of the relationship of atmospheric moisture to temperatures as affecting the over-wintering bees. I believe, too, that we sometimes fail to consider the influence of snowdrifts against the hives and the effect of shelter-belts of trees as additional protection. I remember that while in Kansas a beekeeper called Dr. Merrill to task for recommending any protective covering for hives at all. He said he wintered his bees without any, and asked us to come to see for ourselves the satisfactory condition of his bees. We found his apiary located in the most

sheltered place you could imagine—at the base on the south side of a hill and abundance of trees and undergrowth surrounding it. We told him that such natural shelter-belts undoubtedly took the place of special protective covering, so necessary in apiaries which did not have such protection.

I hardly know what to say about Mr. Manley's experience except that it is most unusual. The high humidity of the atmosphere in the Great Britain region may bring about the difference he mentions. However, this gets back to my original suggestion that possibly the moisture and temperature relationship is at the bottom of the trouble. A better understanding of it would probably explain these differences in results.

J. A. MUNRO.
State Entomologist,
Fargo, North Dakota.

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THE THEORIES OF WINTERING ANALYZED

The present trend in wintering seems to be away from packing and cellaring. Whether this is good or bad is a subject in itself and need not concern us at the moment. The fact that there is a definite and growing opinion to the effect that packing (and cellaring) is both old-fashioned and generally poor in results means, to me, that the principles and good points of both should be salvaged by the industry before finally being kicked overboard for just as surely as a pendulum swings unless the beekeepers thoroughly understand the principles involved in non-packing, the trend will reverse itself in a few more years.

A fact that seems to be but little considered is that packing (and cellaring, which is essentially the same in basic principle) has been very successful in countless cases over a period of years and over a very wide range of conditions. Another fact that seems to be considered still less is that packing, in cases where it is successful, is outstandingly so and colonies thus wintered are far superior to those unpacked, judged by any standard, as to be practically without comparison.

In actual use winter packing, as applied by many beekeepers, has too often shown conditions in the spring to be much below colonies that remained unpacked. With few exceptions such poor results are charged directly against packing with but little or no regard being given to the amount or method of packing or to the strength or condition of the colony when packed. A large number of these have done much toward giving packing a black eye when in all fairness it must be admitted that in most cases the charges should be laid elsewhere. This is especially true where it has been claimed that packing causes moisture to form inside the hive and in the packing itself and that the hive thereby becomes an "ice-box". When such a condition occurs it is not that packing is in itself faulty but rather that the primary facts about packing have not been observed in its application. As to the amount of insulation for any given locality it was Phillips and Demuth who long ago pointed out that enough should be used to prevent condensation on any part of the hive interior (including the floor). This rule was arrived at not only by tests but is a sound law of Physics as well. The fact that when any condensation whatever is formed in a packed hive is proof that this rule was violated. It must be admitted that under-packing rather than overpacking is the usual procedure and in cases where a few layers of newspaper or single thickness of an insulating board is used (usually in connection with tarred paper) this should not even be classed as a packed hive in the true meaning of the term yet "packing" gets the blame if these schemes are not satisfactory.

In the broadest sense all life is derived from the sun. With a **heavily** insulated hive it is apparent that any benefit to be derived from a day or two of sunshine is largely not available to the bees within. They are on their own, practically isolated from the outside world and their requirements must be supplied in advance. In other words, it is absolutely necessary to have a good strong colony with the proper quality of stores before attempting to pack it if best results are to be obtained. In exactly the same manner as in the storing of fruit we must start with the best. **You can't store Drops or imperfect fruit,** yet how many colonies are packed with the hope that the benefits of packing will offset some other poor condition?

Dryness of the hive interior is apparently one of the important points necessary for good wintering. By

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means of large entrances or some form of upward ventilation (or both together) many beekeepers have learned to control this one factor, yet these same beekeepers have difficulty in seeing that when the top is closed, the entrance restricted and some insulation is applied that a set of conditions are brought about actually favoring condensation and that under these same conditions still **more** insulation will correct the trouble. Apparently as long as the entrance is at the bottom it is a case of going either all the way or none of the way with insulation. Part of the way brings more troubles than it cures.

In recent years the term "top-entrance" has been used considerably in the subject of wintering. The original use of the term was for a device to be used the year round under the cover as an entrance and clustering place. When so used the brood nest remains at the top, directly under the entrance and the supers are placed below with the bottom tightly closed. The term "top-entrance" which was originated and used in this connection for some years has been recently borrowed and incorrectly applied to the emergency or auxiliary flight or vent holes drilled by some beekeepers in their brood chambers. This new and misleading use of the term results in the same confusion as did the term foulbrood before the varieties were defined. A definition for the term "top-entrance" should be adopted and a proper descriptive term for the emergency flight holes should be coined to clarify the situation.

JOHN CONNER,
Caldwell, N. J.

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EIGHTEEN YEARS WITHOUT A WINTER LOSS IN THE CELLAR

My method of wintering bees is not applicable to the carload producer, but is for the majority of smaller beekeepers who own less than a hundred colonies and who are located on or north of latitude 42. The details of my system have already been published in three bee magazines, and I fear that to repeat them here would necessitate overstepping the bounds of "a brief comment". However, suffice it to say that I winter my bees in a partitioned-off compartment in my house cellar, where I have absolute control of the conditions regardless of outside weather; every colony I own comes out in the spring "with flying colors" and at an average expense of less than 45 cents per colony. This has been my record for eighteen years, which means that in this time I have wintered a total of more than 700 colonies without a single loss.

All winters look alike in my cellar, and until some means of controlling the weather outside has been devised (which is too big a job for me), I can see nothing to be gained by subjecting my bees to the rigors of our treacherous New England winters, and counting losses practically every year.

C. H. PEASE,
Canaan, Connecticut.

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GENERAL SUMMARY

1. **PACKING OR NO PACKING AND WHEN.**—The first article by Mr. Manley appears to show that insulation of the colony by the hive is a snare and a delusion and packing gets a black eye. The testimony of hundreds of beekeepers as well as scientists show hive insulation may save from five to twenty pounds of stores per hive, over hives not insulated for some localities where the atmosphere is relatively dry and cold. In the region of Great Britain, the Great Lakes, and coastal plains of the United States, there is a large amount of moisture not to say frequent fogs during the cold period of the winter. For these areas double walls and packing are perhaps worse than useless. The colony is surrounded in wet packing that sometimes freezes.

In dry climates, with top and bottom ventilation, insulation may be a benefit. Packing should not be sawdust or planer shavings as they absorb moisture like a blotter. Dry leaves or loose straw not densely packed are better. The conclusion is that a double-walled hive may be all right in some localities but not in others. The English hives as ordinarily built, are doubtless better for Great Britain than a double-walled American hive, especially if the packing material is moisture absorbing.

While admittedly packing is a means of saving stores, the cost of applying it may more than offset its value in some localities. If, say, ten pounds of honey is saved, the honey in the combs would not be worth over three cents against the same honey at five cents in 60-lb. cans. That would mean a net saving of 30 cents. If it costs from 25 to $1.00 to pack a colony no saving is effected.

Again, it is admitted and has been proven that cellar-wintered bees consume less stores than bees wintered outdoors; but it has also been proven that the outdoor-wintered bees are much ahead in brood and bees. A cellar, if constructed right, acts the same as packing. See Conner's article preceding.

2. **MOISTURE A FOE OF GOOD WINTERING.**—All admit that moisture, especially if there is no means for its escape from the clustering space, is a foe to good wintering. In the olden days we had absorbing cushions above the cluster. Damp packing, if it freezes, is worse than useless.

How shall we get rid of it? The old orthodoxy of wintering called for enough packing, of from six to ten inches, to prevent condensation between the outer and inner

walls of the hive. Excessive packing in cold climates will put the colony in cold storage during which time there will be little or no winter brood-rearing. Old bees are constantly dying off and there are no young bees to take their place.

At Medina, thirty miles south of Lake Erie, with a relatively moist climate we have found a 5/16-inch hole through the hand hold of the upper story, both hives single-walled with a restricted bottom entrance, quite satisfactory. For such conditions we recommend an entrance cleat that closes the whole entrance except a slot 1/4 inch by three inches long. The cleat should be so placed that the slot will be on the upper side of the cleat. If on the bottom side the slot may be clogged with dead bees.

The modern way of getting rid of moisure where the climate is not dry, but moist, is by the upper entrance if not too large. Warm moist air rises and escapes if an opening is provided at or near the top through a small hole five-eighths or one inch in diameter. Moisture can escape through the bee escape hole in the super cover leading to a tube to the outside. See discussion of the upper entrances, especially the theory of them, by Mr. Pearson, page 645.

Again, it has been shown that an apiary if located in a hollow or low spot may have an excess of moisture or fog. If the same bees were located on a side hill protected by windbreaks there would be air drainage. The moisture will settle away. This accounts for some winter losses even when all other conditions are met.

3. **WINDBREAKS.**—All authorities agree on the value of windbreaks surrounding the apiary location on three sides, or on all four sides if in young timber or low growing brush. But a windbreak of tall trees, if on four sides, may be too much of a good thing, causing dampness in the apiary site with no means of escape.

4. **YOUNG BEES.**—All authorities agree that in order to get the best results the colony should consist of young bees produced in the fall by a young vigorous queen introduced in August or produced through the means of natural supersedure.

5. **WINTER BROOD-REARING.**—This has been partially discussed in No. 1 at its close. The old orthodoxy of wintering discouraged winter brood-rearing until March. But we now know that winter brood-rearing is a normal or at least a natural function. See page 567 of the September issue. It has been going on for centuries and we did not know it. A good two-story colony of bees may have a little brood-rearing as early as January. The amount of brood will be small and wholly within the cluster. The patches of brood will be larger by February and when conditions are right the young bees may keep up the colony strength even with the old bees dying off. It may even be stronger than in the fall, but in order to have winter brood-rearing it is necessary to have combs of pollen or a mixture of one-fourth natural pollen and three-fourths of soybean flour (not meal) in the form of pancakes.

6. **STORES.**—Preferably there should be sealed honey of good quality and plenty of pollen. When a colony is short of food it should be fed sugar syrup in late fall. There should be not less than 50 pounds for a two-story colony.

7. **WINTERING IN TWO OR ONE STORY HIVES.**—The best beekeepers of the country are wintering in a two-story hive or not less than a story and a half. The winter passageway between the two sets of combs of the hive is important. Many years ago Langstroth recommended a hole near the top center of all the combs so the cluster of bees during winter could move laterally or across the broodnest. With a double brood nest the intervening bee space permits this.

8. **WINTERING IN FOUR-COLONY CASES.**—This plan of wintering is now almost a thing of the past. It is too expensive in first cost, takes too much time to pack and, lastly, encourages drifting. This means that when two colonies face the same direction one will become stronger and its neighbor weaker. The former will be inclined to swarm too early and the latter will have to be reinforced by package bees to bring it up to par.

9. **LOCALITY.**—This has a very important bearing on the method used to prepare colonies for winter. Where it is dry and cold as in the Northwest and not too near the Pacific Ocean and again west of the Rockies, a single wrapping of slater's felt or tar paper around two-story colonies with wide bottom entrances seems to be sufficient. In most cases, as the writer observed in crossing the Continent, in the Rockies not even slater's felt is used. Sometimes the colonies occupy three ten-frame Langstroth stories with no insulation. See what Scullen says, page 641.

Conversely, in localities where it is moist to very moist near oceans and the Great Lakes, some means should be provided to allow the excess moisture to escape from the clustering space. That a moderate opening of three-quarters to one-inch in the upper hive body is not too cold, is shown by the fact that the bees cluster near the hole. During severe zero weather frost crystals may form in the hole. When it warms up outside the crystals will melt. It is thus apparent that the upper entrance may act as a thermostat to control temperatures around the cluster as well as a means for the escape of moisture.

Where it is both moist and cold, some packing surrounded by a double wall to the hive and an upper entrance may be required. In New Jersey or near the Atlantic Ocean, merely placing a couple of matches between the super cover and the top of the hive at the back end may be enough to let excess moisture escape. Sometimes leaving the bee escape hole in the super cover open during the winter is enough, but such an opening should have a channelway leading to the outside.

In the milder climates packing, if kept dry, will save stores but possibly at the expense of brood-rearing in mid-winter. On this point there is a diversity of opinion.

FINAL CONCLUSIONS.—If you are not having the best results in wintering, try some of the newer ideas but on a small scale, sticking to the old orthodoxy or the old methods that have given you from fair to good results. We do not advise dropping packing or insulation of the hive until you find you can get just as good results without them. In many cases you may find a single wrapping of slater's felt around a colony in a two-story hive in a protected locality will enable you to get a crop of honey at less cost than if you go to the expense of packing. Remember there are other important factors, such as young bees, plenty of natural stores, plenty of pollen, and a windbreak of young timber or brush.

The fact that some house builders and architects do not recommend packing between the walls is significant. They give as a reason that it becomes damp, the moisture accumulating on the outer wall of the house.

Further discussion is invited.—Ed.

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Talks to Beekeepers

M. J. Deyell.

Each season in beekeeping is likely to reveal some outstanding facts concerning the nature and management of bees. No two seasons are alike. This past season was quite different from preceding seasons. The difficult problem of applying the principles of beekeeping to varying conditions is still with us. Some experiences this past season have brought to my mind very forcibly the importance and necessity of having strong colonies of bees ready for the major honey flow.

The severe winter of 1939 and 1940 resulted in many weak colonies throughout the North last spring. Due to cold weather in the South it was impossible, in some instances, to secure package bees in time for strengthening weak colonies. In many instances weak colonies were strengthened too late in the season and consequently those colonies were not populous enough in field bees to store the maximum crop of surplus honey.

In our apiaries we added some queenless package bees to weak colonies the latter part of May, because we could not get the packages earlier in the season. Even though these colonies built up to normal strength in due time, many of them did not store much surplus honey. On the other hand, populous colonies that came through the winter in good condition stored a good crop of honey. The weak and strong colonies were in the same apiaries which afforded an opportunity for comparison.

I ran onto an item somewhat recently in the May, 1939, Australian Bee Journal, entitled "Division of Labor in the Hive", which was taken from El Apicultor Chileno. This article has a bearing on the importance of strong colonies. This refers to work done by Dr. Rosch of the Zoological Institute of the University of Munich, who, by the way, has made many valuable contributions to the beekeeping industry.

Quoting from this article, Dr. Rosch says:

All worker bees take up a definite duty in the hive as soon as hatched, and as they increase in age they follow a regular series of labors.

(1) The newly hatched workers occupy themselves cleaning and preparing the cells for the queen to lay in; and this work, apparently insignificant, needs many bees, for the queen lays only in cells recently cleaned.

(2) Three days later the workers begin to feed the larvae, feeding the youngest of them with a special food, and very nourishing, which they prepare, and to which they add substances of animal origin from their own salivary glands.

In this work they remain till twelve days of age and interrupt it only from time to time for cleansing flights—bees never defecating inside the hive—or to take bearings.

(3) Twelve days after hatching bees pass generally to comb building work, gathering wax scales for this purpose from the six wax glands underneath the abdominal segments; these they take in their feet and carry them to their mouths to be masticated and worked up with saliva, and then built into the comb.

During this second period, which lasts from twelve to eighteen days after hatching, the same bees are also busy receiving and removing surplus moisture from honey brought into the hive, and packing pollen in the cells; the field bees brush the pollen off into the cells, and these young bees ram it in, to put as much in the cells as possible.

(4) The bees from 18 to 20 days of age, more or less, install themselves in hiding at the entrance of the hive, or thereabouts, and pounce bravely on any strange bees or other intruders that try to enter the hive; these are the sentries.

(5) Lastly the bees become field bees and stay at that work till they die, and with difficulty change this work for any other, in exceptional cases, when the existence of the hive is in peril.

It would seem, then, from the foregoing, that there are at least five general types of labor performed by bees in a normal colony. The young bees, after emerging from their cells, perform the menial duties of the hive and later during different stages of their career, they graduate from one grade to another higher up, until eventually they become seniors, so to speak, and are ready to fly out into the fields for larger service. What a marvelous division of labor!

Assuming that worker bees are almost three weeks old at the time they begin to fly out of the hive in search of nectar, pollen, propolis, and

water, also that during the height of the season, worker bees live only six or seven weeks, this would leave approximately four weeks in which worker bees do field work. Is it any wonder that the queen bee is required to lay a large number of eggs daily during the active season? The birth rate must excede the death rate in order to keep up the population of the hive. Heavy egg laying is necessary also to produce a colony with a high percentage of field bees, in order that the maximum crop may be stored.

A Point in Favor of Two-Queen Colonies

Last week while attending the Newport, Indiana, meeting I listened to Dr. Farrar of Madison as he presented his method of managing two-queen colonies. What he said has a direct bearing on the importance of strong colonies of bees.

Without going into minute details concerning Dr. Farrar's method of management, he found that by dividing the brood in a very populous colony six or seven weeks prior to the beginning of the major honey flow, and giving a young laying queen to the queenless brood, which is usually set on top and separated from the queenright brood chamber below by one or two supers, that one large two-queen colony will store more than twice as much honey as a single-queen colony.

By uniting the two brood chambers about four weeks before the close of the honey flow, disposing of the old queen and retaining the young queen, this very populous united colony will store an ample amount of pollen which is so necessary for brood-rearing during early spring, prior to the time pollen is available from natural sources.

Dr. Farrar is right in saying that **one way to overcome low honey prices is to increase the average per colony production of surplus honey.**

I have never given the two-queen colony method a thorough try-out, but hope to do so next year. During the past two seasons some of our single queen colonies in western Ohio were piled so high that we found it difficult to put on and remove supers, without using a box to stand on. We are wondering what would happen if we used two-queen colonies in that area. We would perhaps have to build scaffolds alongside of the hives, or else use wide hives that would hold more combs.

Be Sure Colonies Have an Abundance of Stores

A great many beekeepers winter in double brood-chamber or food-chamber hives. If the top brood-chamber or food-chamber is well filled with honey, in addition to what honey there may be in the bottom brood-chamber, colonies are likely to winter well especially if they are protected from the prevailing winter winds and the hives containing colonies are given a reasonable amount of insulation or packing. It is important that the packing material be kept dry.

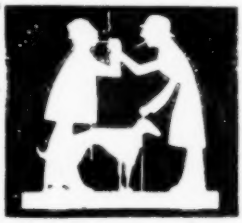
For beekeepers who do not use food-chamber hives, it is necessary to carefully estimate the amount of honey in each hive. In some regions, where a fall honey flow is prevalent, colonies will fill the combs in the brood-chamber as the last brood of the season emerges. In order to estimate the amount of honey in a single-story hive one should keep in mind that a standard comb filled with honey contains between five and six pounds of honey. One can estimate, approximately, on this basis, the amount of honey in a hive.

Another way to determine the approximate amount of honey in a hive is to weigh the hive and bees. The gross weight of a single-story ten-frame hive of bees should be not less than 80 or 85 pounds, which leaves about 45 pounds of honey for a colony. The hive with a single cover and inner cover, also empty combs, weighs about 33 pounds. Making allowance for some pollen and about 5 pounds of bees, 40 pounds to be deducted from the gross weight should determine the approximate amount of honey. Any shortage of honey should be made up by substituting combs heavy with honey, if available, for empty combs, or, by feeding sugar syrup.

How to Make and Feed Syrup

To estimate the amount of sugar syrup needed, one should plan for as many pounds of sugar as the colony is short on stores, not allowing for water used in making the syrup. For example, if a colony needs ten pounds of stores, ten pounds of sugar should be secured for making syrup. To make the syrup, use only the best grade of granulated sugar. Brown sugar will not do. Syrup should be mixed in the proportion of two parts of sugar to one part of water, either by weight or by measure. The water

(Continued on page 660)

Asked and  Answered

Section Honey Darkened

Question.—I have a colony which built up very strong and was put on comb production. I have three supers completed which are pure white but some of the sections have a distinct grey and black cast. Before putting on the supers I had on a shallow super for winter feeding which contained a lot of black pollen from tulips and black stamin spring flowers from the states near here. Could some of this pollen be mixed in the honey and could it have been taken from the shallow frames which were above the comb supers?—L. W. Franks, Illinois.

Answer.—It seems possible that some of your comb honey sections containing white honey may have discolored somewhat as a result of the bees in the colony having had access to the darker honey and black pollen in the comb of your shallow brood chamber above. Our experience along this line has led us to the conclusion that it is preferable to keep the food chamber directly above the brood chamber, instead of on top of the pile of supers. The double brood chamber affords comb space for the storage of pollen and consequently there is less likelihood of pollen being stored in the comb honey sections.

Two-queen Colony

Question.—In my observation hive I bred two good queens which, due to their small one-frame colonies, I put together in one regular hive with a one-inch thick bee-tight divider under an excluder. They got along very well and were later separated and built up. Later after a good deal of brood was in both hives, one of the queens died or was destroyed. Is it possible to have the bees mix above two queens in this manner with success with proper introduction?—L. W. Franks, Illinois.

Answer.—Yes, it is possible to maintain two queens in a double brood chamber hive, each brood chamber being separated from the other by means of a tight-fitting division board directly under the queen excluder over which supers are placed. A beekeeper in the Red River Valley region maintains a large apiary of double brood chamber hives. Each brood chamber has seven standard combs. Regular 10-frame supers were placed above the queen excluder which partially covered the 14-frame double hive. The outer portions of the brood chambers were covered over with special wooden covers. It has been found that two queens will continue to do normal work during the honey flow, but at the close of the honey flow either one of the queens will be destroyed, only one of the queens surviving.

Uniting Package with Weak Queenless Colony

Question.—I have a weak colony that has no queen and I want to put a two-pound package with queen with them. Tell me how to do it?—W. H. Anderson, Pennsylvania.

Answer.—It is possible to unite a package of bees and queen with a weak colony that has no queen. If you will feed the bees in the shipping cage all of the sugar syrup they will take, by painting the wire screen with sugar syrup, until the bees have taken all of the syrup they will hold, the package and queen may be put into the hive containing the weak colony. The two lots of bees will not fight because the bees being put into the hive are filled with syrup. The sugar syrup should be made from granulated sugar, one part of sugar to one part of water, either by weight or by measure.

Honey for Diabetics

Question.—Can you give me any information concerning diabetics and the use of honey?—Allan Stewart, Jr., New Jersey.

Answer.—Some diabetics, if the disease has not progressed too far, can eat a small amount of honey, especially tupelo, or any honey high in levulose. However, a physician should be consulted in order to determine the degree of toleration. It is important to take only a very small amount of honey at the start, gradually increasing the amount, if sugar does not show in the blood or urine. A large number of diabetics have been benefitted by the use of honey, but others are unable to use it at all.

Curing Fermented Honey

Question.—Can I feed some honey that is fermented slightly to the bees at this time and if worked over into new honey can it in any way affect the crop now on, if capped?—R. O. Adkins, Virginia.

Answer.—As a rule, if warm weather prevails and there is practically no nectar coming from the fields, the bees will cure honey that is not all sealed over, even though they are not sealing honey. You understand, of course, that it is necessary that there be a honey flow in progress before bees can secrete wax

freely. We are of the opinion that you could feed some slightly fermented honey to the bees and have them work it over, without danger of causing fermentation in the new crop. In order to do this, you would have to mix the honey with water, in the percentage of 75% honey and 25% water, in order to have the bees take it. The honey in its normal form would be rather heavy for the bees to handle.

Wintering Bees in an Open Building

Question.—I want to store my bees this winter in a small building open on the south side. Would like to move them in as soon as possible this fall. How can I prevent their coming out, returning to the old stand (not far away), and being lost? An old beekeeper told me to put screen over the entrances and keep them in several days. Would that be advisable?—M. L. Hicks, New York.

Answer.—It may be advisable to move your bees into a small building, open on the south side, provided your hives are so arranged that the bees may have easy access to the outside, also that the bees may be able to return to their hives easily. If you move the bees from their present location into the small building open to the south while bees are still flying a little each day, many of the old bees, when they take a flight, after being moved to the new location, will naturally return to their former location. As a rule when no hives, nor any semblance of hives are left on the old location, the bees are likely to fly around a bit, then return to their hives on the new location. It is very important, therefore, to leave no hives on the old location. Furthermore, it will be well to move your bees late in November, after they have had their last cleansing flight. The hives should be moved as carefully as possible, to prevent getting the bees stirred up. It would be inadvisable to place entrance screens over the entrances as this would cause the bees to worry in an effort to get out. If you do use the small building with the open side to the south for wintering your bees, we suggest that you place the hives some little distance apart, if possible, so that there may be less drifting of bees from one hive to another, when they take winter cleansing flights. Generally speaking, it is better to winter bees out of doors in a spot reasonably well protected from the prevailing winds. The hives in your locality should have some protection in the way of added insulation.

Silver-berry Honey

Question.—Please describe the honey of the Silver-berry (Elaeagnus argentea) as to color and flavor, also the geographical location.—K. W. Taylor, Alberta.

Answer.—In his book, "Honey Plants of North America", John Lovell describes Silver-berry as a shrub with twigs covered with brown serf becoming silvery. It is found from Utah to British Columbia and Minnesota. He says that the fragrant, pale yellow flowers secrete nectar freely and are visited by bees. Frank C. Pellett, in his book entitled, "American Honey Plants", says that Silver-berry is said to yield honey on the prairie and refers to an article in the November, 1917, American Bee Journal, by W. J. Sheppard of British Columbia. Mr. Sheppard says that Silver-berry blooms in May but that he has never found bees on it in that province.

Honey in Food Chamber Granulates

Question.—How long should honey be left in the brood chamber? I have been leaving full-depth supers full of honey besides what was in the bottom super for the last 5 years. Some of the frames have the cappings which have turned brown and some have granulated. Should these be taken out and allow only the fresh honey to remain for winter or will the bees be able to use this old honey left from year to year? When extracting is it advisable to store frames of honey that have pollen in them for use the next year in new hives when making increase with package bees? If these frames should granulate is it all right to use them?—T. S. Stamps, Michigan.

Answer.—Deep food chambers of honey sometimes become partially granulated during a part of the year when the weather is cool. As a rule, the combs containing granulated honey are not detrimental in any way to the colony. When the weather is warm during the summer months the granulated honey in the combs will become liquid and will thus be available for the bees. Even though honey may be slightly granulated, the bees will utilize it, especially during weather warm enough for the bees to collect water. Combs containing pollen are especially good for using in hives intended for package bees. Bees require a considerable amount of pollen and combs with pollen in them are valuable because the bees do not need to work so hard gathering pollen from natural sources. Therefore, if you have in mind installing packages next spring, you should select some combs containing honey and pollen, for putting into the hive which you are going to use for packages.

XUM

American Honey Institute News Notes

The fall issue of Institute Inklings will be in members' hands soon. This issue has a wealth of material on how to sell honey. An article entitled "Bake Goods with Honey if you Want to Make More Money" by Sam T. Goetz, the Retail Bakers' Friend, is one you and your baker can profit by. Mr. Goetz has given us a few of his choice recipes "that have proved to be very popular and money-makers in many busy stores". You will want to give a copy of this to your baker.

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Among the visitors at the American Honey Institute office the past month were Mr. Woodrow Miller of Colton, California, and Mr. B. L. Maricle of Brighton, Illinois.

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Departments of Markets in the various states are very much interested in the promotion of the use of honey. May I quote from a few letters from some of the states:

"We believe that a more general use of honey as a sweets food would contribute much to the health of the people. We believe that many of the human ills now frequently occurring could be avoided or corrected by the use of honey instead of so many other types of sweets. We shall cooperate by giving the matter publicity in our local papers and in any other ways whenever possible."

"We have a weekly radio program for consumers which goes on the air over approximately twenty-five state stations and all or part of one of these programs will tie in with your plans for National Honey Week."

"Your letter of September first about a National Honey Week is received, and as you state, honey is not only a farm product but promotes the use of other farm products. I think a nation wide week to further this worthy cause is highly desirable."

From a governor: "In response to your recent letter, I have issued a proclamation setting aside the week from October 28 to November 2 as National Honey Week in Ohio. I have given the newspaper men who cover the State House a copy of the proclamation and I am also inclosing a copy in this letter for your files."

"We think this is a good idea and we will be glad to cooperate with you in every way we can. We are going to carry a notice to this effect in our Market Bulletin, which has a circulation of more than 140,000 copies every two weeks. If there are any other suggestions you would like to offer, we will be glad to hear from you."

An idea for others!—"Have you heard that National Honey Week will be celebrated this year from October 28 to November 2? The American Honey Institute proposes to make a big thing of the celebration, with special recipes to induce the city housewife in particular to use more honey in the home dietary. New Jersey has a large stake in the honey business, so I am going to give my Home and Household readers opportunity to win some $1 awards with favorite recipes of their own, in which honey is an important ingredient. Send in your offerings promptly, just as soon, in fact, as you read this. I'll return your favors in our October issue with some of the splendid recipes the American Honey Institute has sent me as a means of boosting Honey Week."

Page 38. New Jersey Farm and Garden, September 1940.

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The Institute has a "Honey for Breakfast" sticker that you may purchase to use on letters or on your honey jars or pails. Look for a sample on the envelope in which your Institute Inklings is received.

• • •

Let us get Honey off the shelf and on the counter. Let us get honey on the store demonstration sales. Back of all sales devices one thing is essential—clerks in stores handling honey must know their honey. The Cooperative Merchandiser published an article which we believe is of inestimable value to the producers. This article appears now in the fall issue of Inklings through the courtesy of Cooperative Merchandiser. You will want to give a copy of this to your storekeeper.

• • •

Let us put Summer's Sweet into Winter Candies!

• • •

If you

a Happy Cook would be
Use Honey in your recipe.

Buy and Sell Here

CLASSIFIED ADS

Only responsible advertisers and honest advertisements will be admitted to these columns. References required from new advertisers not known to us. Rate—7 cents per counted word each insertion. Each initial, each word in names and addresses, the shortest word such as "a" and the longest word possible for the advertiser to use, as well as any number (regardless of how many figures in it), count as one word. Copy should be in the 10th of month preceding.

HONEY FOR SALE

NEW CROP choice clover honey, 6½c. John Bour, Tiffin, Ohio.

CHOICE white clover honey in new 60's. Noah Bordner, Holgate, Ohio.

NEW CROP clover extracted honey. H. E. Crowther, Cass City, Mich.

EXTRA QUALITY clover extracted. Howard Grimble, Holcomb, N. Y.

CHOICE light clover honey in new 60's. George M. Sowarby, Cato, N. Y.

FOR SALE—Best clover honey, new 60's. Irvin VanDevier, Medina, Ohio.

FANCY clover honey, case or quantity. E. J. Stahlman, Grover Hill, Ohio.

NORTHERN MICHIGAN honey in new cans. C. J. Freeman, Mesick, Mich.

FINE clover honey, case or car. Leslie A. Davis, R. R. 2, Union City, Ind.

FOR SALE—Extracted and comb honey. M. W. Cousineau, Moorhead, Minn.

HONEY—Light and light amber extracted. F. W. Lesser, Fayetteville, N. Y.

COMB HONEY, 150 doz. Fairland Apiaries, 260 Park Drive, Dayton, Ohio.

CHOICE MICHIGAN clover honey in new 60's. David Running, Filion, Mich.

CHOICE clover honey in 60's. R. C. Bish, successor to Moore Apiaries, Tiffin, Ohio.

CLOVER COMB HONEY—No. 1 to Fancy white comb. Louis Regner, Swea City, Iowa.

WHITE, and amber extracted, also white comb honey. Harry T. Gable, Romulus, N. Y.

NEW HONEY—white clover, new cans, finest ever, new comb. N. B. Querin, Bellevue, O.

Clover honey in sixties and comb honey. George Eykamp, 1221 Akin, Evansville, Indiana.

FOR SALE—Choice honey for chunks, also comb and extracted. C. E. Baier, Cissna Park, Ill.

FOR SALE—Fancy Iowa white clover extracted honey. Kalona Honey Co., Kalona, Iowa.

CHOICE clover honey. Case, $6.60. Sample, 10c. Martin and Fuller Apiaries, Owosso, Michigan.

FINE CLOVER extract in glass or tin. Earl Alexander, 2521 Fleming Road, Middletown, Ohio.

ORANGE, palmetto and mangrove honey in new sixties. Peter W. Sowinski, Fort Pierce, Florida.

HONEY PACKERS—Write us for prices on carload lots of California and western honeys. We stock all varieties. Hamilton & Co., 1360 Produce St., Los Angeles, California.

EXTRACTED clover and amber honey. Quotations on request. Scott Traxler, Scottsburg, N. Y.

WHITE CLOVER extracted and comb honey. Ralph Hibbard, 131 Benedict St., Watertown, N. Y.

WHITE clover comb priced very reasonable. 1940 crop. Extra nice. Clarence Engle, Kearneysville, W. Va.

FINE QUALITY new clover honey in new cans. Case or quantity. Scott's Honey Farm, La Grange, Ind.

HARRIS'—Fancy clover extracted, new crop, in new sixties. Case or carload. J. N. Harris, Saint Louis, Mich.

FOR SALE—1940 crop, white clover extracted honey in 60-lb. cans. L. S. Griggs, 711 Avon St., Flint, Mich.

MICHIGAN White Extracted in 60's. Strictly high grade in new cans. M. H. Hunt & Son, Lansing, Mich.

PROCESSED white clover honey in 60 and 5 lb. pails. Sample, 10c. F. W. Summerfield, Grand Rapids, Ohio.

HONEY FOR SALE—All kinds, any quantity. H & S Honey & Wax Co., Inc., 265-267 Greenwich St., New York, N. Y.

FANCY white clover extracted honey, can or carload. Price on request. Sample 15c. Jos. H. Hoehn & Sons, Ottoville, Ohio.

WHITE CLOVER COMB, $3.00 case; amber, $2.50; clover extracted, 7c; amber, 6c; buckwheat, 6c. C. B. Howard, Geneva, N. Y.

LET US show you how you can save on your honey purchases. We also buy honey. H. Blitz, P. O. Box 3452, Philadelphia, Pa.

FOR SALE—Fine clover honey, extracted in 60-pound cans. Satisfy yourself. Sample for the asking. W. S. Earls, New Canton, Ill.

NEW CROP clover-basswood honey, water white in new cans. Send for sample and price. A. A. French & Son, Theresa, N. Y.

COMPLETE line comb and bottled honey, pure clover. Also packed in 5's and 60's. Central Ohio Apiaries, Inc., Millersport, Ohio.

SELECT LOTS white sweet clover, also processed white honey in 60-pound tins. A. I. Root Co., 224 West Huron Street, Chicago, Ill.

CHOICE white sweet clover, also extra light amber honey in new 60-pound tins by the case or carload. Dadant & Sons, Hamilton, Illinois.

OUR 1940 CROP of Michigan clover honey is now ready for the market. New cans and cases. Let us supply you with your requirements during the coming season. E. D. TOWNSEND & SONS, Northstar, Michigan. The center of the Clover belt.

XUM

QUICK SERVICE
Dependable Selected
ITALIAN
Queens
THE PUETT COMPANY
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Requeen with CARNIOLANS and save on winter stores. Untested Queens, 50c each; ten or more, 45c each, postpaid. Airmail, 5c per queen extra.

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THREE-BAND ITALIAN QUEENS

—Price—
Young laying queen, 35c each.
W. O. Gibbs
Phone 150. Willacoochee, Ga.

We discontinued all shipping June 10th and will use the remainder of the season for making preparations for our 1941 business.

CAUCASIAN APIARIES
Brooklyn, Ala.

Mountain Gray
QUEENS

With your faith in our queens and confidence in us we have had record sales this year. We are running 3 large mating yards. Order while you can get fresh young queens direct from our yards, 50 cts. each.

15% to dealers. Safe delivery guaranteed.

BOLLING BEE CO., Bolling, Ala.

NEW CROP extracted honey, white clover, amber and buckwheat. Prices on request. Sample 10c. Frank R. Parmelee, Le Roy, N. Y.

HONEY—Clover, light amber and buckwheat, in 5-lb. and 60-lb. sizes. Buckwheat also in kegs. Earl Rulison, Route 1, Amsterdam, N. Y.

FOR SALE—Finest quality white and sweet clover honey in new 60-lb. cans and corrugated cases, $3.65 a can. Martin Carsmoe, Ruthven, Iowa.

40 TONS white clover extracted honey, case, ton or carload. Write for prices and sample. LEROY C. KEET, 1003 Leray Street, Watertown, N. Y.

NUMBER ONE buckwheat honey, free from wax and foam, new 60's. 1-10 cases, 6½c, over 10, 6 cents. F.O.B. Woodward Apiaries, Clarksville, N. Y.

NO. 1 to fancy light comb honey, $2.75 per case; No. 2 and amber, $2.25; in window cartons, 25c extra. Extracted, 6c in 60's. H. R. Shelton, Parma, Mich.

NO. 1 WHITE COMB per case, $3.00; No. 2, $2.50; No. 1 light amber, $2.50; No. 2, $2.00. White extracted in 60's, 6c; light amber, 5c. F. J. Smith, Castalia, Ohio.

COMB No. 1, weight clover $3. No. 2, $2.50 per case of 24 sections, six and eight case carriers only. Extracted clover in 60's, 6c. Discount on honey taken from our door. H. G. Quirin, Bellevue, Ohio.

NEW YORK State comb and extracted honey, buckwheat and cover, any quantity, all size packages. Five-pound pails my specialty. Edward T. Cary, Midland Ave. and Tallman St., Syracuse, N. Y.

STOLLER'S excellent quality clover. Honey packed in 60's. Finest obtainable, ready for shipment. Write Stoller Honey Farm, Latty, Ohio.

RASPBERRY HONEY blended with milkweed honey, two of the best honeys of Northern Michigan. Packed in 60-lb. cans, for 7c a lb. In 10-lb. cans for $2.00. We pay postage. Sample for 20c. Elmer Hutchinson & Son, Lake City, Michigan.

HONEY AND WAX WANTED

BEEKEEPERS TAKE NOTE—We will not guarantee any honey buyer's financial responsibility and advise all beekeepers to sell for cash only, or on C. O. D. terms except when the buyer has thoroughly established his credit with the seller.

WANTED—3 tons amber honey. Fairland Apiaries, 260 Park Drive, Dayton, Ohio.

WHITE and light amber extracted and comb honey. George Eykamp, 1221 Akin, Evansville, Indiana.

WANTED—White clover honey. New cans only. Clover Blossom Honey Co., 712 Kossuth St., Columbus, O.

CASH PAID for carloads and less of white extracted honey. Send sample and lowest price. F. M. Babcock, Fredonia, N. Y.

WANTED—Carlots honey; state quantity, shipping point and price. Mail sample. Bryant & Cookinham, Inc., Los Angeles, Calif.

FOR SALE—Fine quality queen mailing cages; Root quality bee supplies, both comb and extracted honey. Orders filled promptly. Write us or drive over M53, fifty miles north of Detroit. Hamilton Bee Supply Co., Almont, Mich.

WANTED—Comb, chunk comb, white and light amber extracted honey. Any amount. Central Ohio Apiaries, Millersport, Ohio.

HIGHEST cash returns made the day we receive your beeswax. Write for shipping tags and quotations. Walter T. Kelley Co., Paducah, Ky.

WANTED—White clover and amber extracted honey, any quantity. Write or call. Mizerny Meat & Poultry Company, Toledo, Ohio. Main 1174.

CASH PAID FOR carloads and less than carloads of extracted honey. Send sample and best price. C. W. Aeppler Company, Oconomowoc, Wis.

WANTED—White and amber extracted Honey, any quantity, also Beeswax. Write The Fred W. Muth Co., Pearl & Walnut Sts., Cincinnati, Ohio.

WANTED—All grades of comb and extracted honey. Bee supplies and honey containers for sale. Prairie View Apiaries, 12243 12th St., Detroit, Michigan.

HONEY WANTED—Carloads and truckloads for our Oklahoma plant. Could use a truckload of shallow frame comb honey. Old Taylor Honey Co., Harlan, Iowa.

FOR SALE

QUEENBEE PAINTING outfits. $1.00 postpaid. Southwick Apiaries, Waban, Massachusetts.

WAX worked into quality medium brood foundation for 15c pound; 100 pounds, $10.00. Fred Peterson, Alden, Iowa.

CUT COMB HONEY—Cartons and equipment. Get our prices on everything for cut comb honey. James Hilbert, Traverse City, Michigan.

ATTRACTIVE prices on bee supplies and comb foundation. Send for catalog. Saves you money. The Fred W. Muth Co., Pearl and Walnut Sts., Cincinnati, Ohio.

WRITE FOR CATALOG. Quality bee supplies at factory store prices. Prompt shipment. Satisfaction guaranteed. The Hubbard Apiaries, Onsted, Michigan.

COMB FOUNDATION at money-saving prices. Plain, wired and thin section. Wax worked at lowest rates. Comb and cappings rendered. E. S. Robinson, Mayville, N. Y.

CARTONS for cut Comb Honey. New attractive designs with your name and address. Low prices. Fast service. Samples on request. May Carton Co., Box 257, Traverse City, Michigan.

SAVE MONEY by letting us work your wax into wired or regular comb foundation. Large catalog describes everything. You pay only wholesale factory prices, as we have no agents. Walter Kelley Co., Paducah, Kentucky.

FOR SALE—We are constantly accumulating bee supplies slightly shopworn; odd sized, surpluses, etc., which we desire to dispose of and on which we can quote you bargain prices. Write for complete list of our bargain material. We can save you money on items you may desire from it. Dadant & Sons, Hamilton, Illinois.

BEES AND QUEENS FOR SALE

ITALIAN QUEENS. W. G. Lauver, Middletown, Pa.

THREE-BANDED Italian queens, 50c each, select. Alamance Bee Company, Graham, N. C.

Queens

Our Imported Strain of Italian Bees has again demonstrated their superior wintering and honey producing qualities.

Requeen now with our select young queens to insure better results next year. Prices 1-10, 50c each; 11-25, 45c each; 26-up, 40c each.

Rossman & Long
Box 133, Moultrie, Ga.

QUEENS

Three-Banded Italians

Three for $1.00

THE CROWVILLE APIARIES
Rt. 1, Winnsboro, La.

QUEENS
Italian or Caucasian

One to 25—50 cents each
26 to 49—45 cents each
50 and up—40 cents each

Weaver Apiaries, Navasota, Texas

QUEENS

Italians of Quality

50c; 12 or more 40c.

JOHN G. MILLER
723 C St., Corpus Christi, Texas

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XUM

Preparedness

--Is the order Now--

A colony of bees (unless it has outside help) is never any better than its queen, so why take chances on an old worn-out one when you can get a Stover Queen for so little.

ITALIANS CAUCASIANS

—Prices—

1 to 24 .....$ .50 Each
25 to 99 .....$ .45 Each
100 or more .....$ .40 Each

You'll like our long-life Cypress Hives—Write for Catalog and Quantity Prices—

THE STOVER APIARIES

MAYHEW, MISSISSIPPI

TOO LATE TO CLASSIFY

1940 CROP clover in new sixties. Write for prices. Sample, 10c. Meyer Toom, Route 4, Knoxville, Iowa.

ROOT'S 4-frame automatic reversible extractor, 12-in. pockets, in good repair, used very little. Price, $40.00, or will trade for rip-saw table. A. E. Shaw, Shannon, Miss.

TALKS TO BEEKEEPERS

(Continued from page 653)

is heated to the boiling point, the sugar is stirred in and mixed until all the granules are dissolved.

Winter Protection Essential

Colonies in single-walled hives wintered outside in the North should be packed. If no regular packing cases are available, each hive may be placed in a box large enough to allow three or four inches of packing (dry forest leaves or wheat chaff) on the sides and ends, five or six inches on the top, and two or three inches on the bottom. A bridge, or tunnel, can be built from the entrance of the hive to the outside to permit the bees to fly on warm days. The opening at the outside of the tunnel should be at least 3 by $\frac{1}{4}$" to exclude mice. Many beekeepers use building paper, with packing material between the paper and hive. It is very necessary that packing material be kept dry.

40 CENTS EACH, for good three-band Italian queens. October price. D. W. Howell, Shellman, Georgia.

FOR SALE—Pure Italian bees and queens, 35 cents each. Graydon Bros., Route 2, Greenville, Ala.

FOR SALE—Empire State strain Italians. Bred for honey production, 50c each. Coggshall & Son, Groton, N. Y.

CAUCASIAN QUEENS, untested 40c each until Nov. 1st. Safe arrival. Lewis & Tillery Bee Co., R. 4, Box 132, Greenville, Ala.

ITALIAN QUEENS. N. J. Experiment Station stock, selected, carefully reared, 75c each. Circular. E. G. Carr, Pennington, N. J.

FOR SALE—47 hives of bees, guaranteed free from disease, $5.00 per hive. Equipment for extracting honey. Victor G. Berrian, Highland, N. Y.

100 COLONIES for sale in two body, eight-frame standard hives, certificate of inspection furnished. All young Root queens and equipment. Benjamin Hosley, Canton, N. Y.

FOR SALE—10 to 50 colonies of bees, standard 8 or 10 frame hives, $4.00 per colony or will exchange for comb or extracted honey. Bees guaranteed free from disease. George Walthousen, 755 State Street, Schenectady, N. Y.

NORTHERN BRED Leather-colored queens, 35c, 3 for $1.00. We cooperate with honey producers in selection of our breeding queens and believe our stock to be as good as the very best. For prompt service and good queens send your orders to Diemer Bee Co., Liberty, Mo.

FOR STRONGER COLONIES, bigger honey crops, and gentler bees, try our prolific well-bred 3-banded Italian queens used for years by leading beekeepers of the U. S. and Canada. Select young laying queens, 50 cents each; ten, 45 cents each; twenty or more, 40 cents each. Prompt deliveries, no disease. We have one of the largest best equipped queen rearing places in the South. H. C. Short, Fitzpatrick, Ala.

MAGAZINES

DAIRY GOAT JOURNAL, Dept. 419, Fairbury, Nebr. (big monthly magazine, 3 years $1), gives complete information. Introductory 5 months, 10c.

MICHIGAN BEEKEEPER. The State Bee Magazine with a National Circulation. 75c a year, 2 years $1. MICHIGAN BEEKEEPER, R.F.D. 3, Lansing, Mich.

THE INDIAN BEE JOURNAL—The only bee journal in India. Sample copy free. Yearly 7c6d. Apply Editor, Indian Bee Journal, Jeolikote, Dist. Nainital, U. P. India.

MANY beekeepers have proven raising fox, mink, nutria, muskrats, rabbits, highly profitable. Send dime for sample copy Canada's oldest fur farming magazine telling how. Fur Trade Journal of Canada, Box 31, Toronto 2, Ontario.

THE BEE WORLD—The leading journal in Great Britain and the only international bee review in existence. Specializes in the world's news in both science and practice of apiculture. Specimen copy post free, 12 cents stamps. Membership in the Club, including subscription to the paper, 10/6. The Apis Club, L. Illingsworth, The Way's End, Foxton, Royston, Herts, England.

JUST NEWS

(Continued from page 637)

The October meeting of the Middlesex County Beekeepers' Association will be held at 7 P. M. Saturday, (26th), at 19 Everett St., Concord Mass. Mr. Benjamin R. Hildreth, of Holliston, will speak. His subject will be "From Hive to Consumer". Mrs. Nelson of Lexington and Mrs. Lund of Waltham will be in charge of the supper featuring scalloped foods, cream of tartar biscuits with honey, pickles, and honey squash pies with doughnuts, cheese, coffee, and cider. The Ladies' Auxiliary will elect its officers.—A. M. Southwick, Pres.

• • •

On September 12, 1940, a group of Northwest Iowa beekeepers met in Spencer, Iowa, and discussed the possibilities of organizing a Northwest Iowa Beekeepers' Association. The idea met with the instant approval of those present who proceeded to elect temporary officers as follows: Floyd Hoovel of Fostoria, President; Adolph Land of Newell, Vice-president; and Robert Savage of Spencer, Secretary. A permanent election of officers for the coming year will be held at the next scheduled meeting of the Northwest Iowa Beekeepers' Association on October 10, 1940 at 7:30 P. M. at the Clay County Bank Building, Spencer, Iowa.

Honey Wanted

We buy all grades. Send samples, state quantity and quote best cash price delivered to us

HONEY SALES COMPANY
1808 No. Washington Ave.
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Send for our Container Price List and save

BETTER-BRED QUEENS **Three-banded Italians**

3 for $1.00. Head all of your colonies with our Better Bred Stock. They have proven their good qualities throughout the U. S. A. and Canada. Use them for increase, requeening and swarm control. **CALVERT APIARIES, CALVERT, ALABAMA**

Our Industry's Greatest Need is Greater Consumer Interest in Honey

The American Honey Institute is interesting food organizations over the country in honey. Help yourself by helping the Institute.

Even $1.00 will help. Send remittances to

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Madison, Wisconsin

XUM

York's Package Bees and Queens

Quality Bred Italians
More for Your Money

Queens, 50 cents each; ten up, 40 cents each. Two-pound packages with queens, $1.60 each; ten up, $1.50 each; three-pound packages with queens, $2.10 each; ten up, $2.00 each. Prompt shipment.

Book orders now for shipping dates wanted. Full weights, safe arrival and satisfaction guaranteed.

York Bee Company
Jesup, Georgia, U. S. A.
(The Universal Apiaries)

ITALIAN QUEENS

Shipped same day order is received.
1, 50c; 6, 45c; 12 or more, 40c

CITRONELLE BEE CO.
Citronelle, Alabama

We thank our many customers for a nice business and for patience when we were sometimes unavoidably late. Owing to bad weather it has been a hectic season.

We still offer queens at 50c for 1-11, 45c for 12-23, 40c for 24-49 and 35c for 50-up. Cash with order, safe arrival guaranteed.

Our best friends are satisfied customers.

MORLEY PETTIT, Tifton, Georgia

BEE HUNTING DE LUXE

(Continued from page 621)

When we at last had the opening large enough I found to my disgust there were not more than about three pints of bees in the swarm. I later learned this was about an average wild swarm in this part of the world. They, like the native Puerto Ricans, breed early and often. Natural swarms are not noted for their strength in numbers, but they certainly do know how to sting.

After about an hour of punishment trying to keep the peons from being entirely chased out of the picture I got the bees into the hive with the combs cut out and tied into Hoffman frames. After the most of the flying bees had settled on their combs the inner cover was slid over and nailed fast. We then made our way homeward.

With the exception of myself all were happy in making the successful capture. We were returning with the records of our valor on our bodies. The bees safely caged in the hive would be shown as proof of our success. Personally I looked upon it as a waste of time. This is the modus operandi of taking a swarm of bees from a bee tree native fashion as it is done in the West Indies.

Dayton, Ohio.

• • •

SMALL HONEY PROCESSING PLANT

(Continued from page 631)

when the pipe nozzle is pushed down at one corner so that it is deeper than the other three corners, when presto, almost every drop of honey is sucked up. Each can is emptied in succession in the same way.

By the old way, each can full of honey had to be lifted out of the water one by one, and when inverted would not let all the honey run out. By the Diehnelt plan all the honey is saved except the smear in the inside of the cans and the heavy lifting is avoided.

We Produce Queens Until Late Fall

Use our Quality-Bred Progeny Test Queens for best results. Our prices place Record-Breaking Quality within reach of all.
1 to 99 @ 35c each. 100 or more @ 30c each.

GARON BEE COMPANY **Donaldsonville, La.**

CASE HISTORY OF EUROPEAN FOULBROOD

(Continued from page 614)

good crop of all honey without destroying a single comb. Mr. G. F. White showed repeatedly in his well-known experiments with EFB that heavily infected combs of brood could be placed in healthy colonies, where the combs would be cleaned up without any reappearance of the disease.

Since 1908, EFB has been, many years, the source of our greatest loss in bees. Some springs in our apiaries we have had as many as three or four hundred hives infected with the malady in varying degrees. We have learned that in most instances the best thing to do is to move the bees to a honey flow on a different type of floral source. We have discovered that EFB is a disease which is harmful to an appreciable extent only when the resistance of the bees is low; the strength of the respective colonies having little influence on the progress of the disease. Just what I mean by the "low-resistance" of the colonies of bees, I shall attempt to make clear in my following paper on the causes of European Foulbrood.

Coming back to the advent of EFB in Fresno County, as described above, I want to state again that I do not know of a satisfactory theory that will completely explain how the disease spreads so rapidly. I have discussed several theories here, but I do not feel that any of them offer a really satisfactory explanation. I hope though, that I have presented a few facts about EFB that might point towards, at least, a partial re-statement of the problem.

Selma, California.

"She-suits-me" queens, 3-banded Italians, most excellent strain: One queen, 75c. 3 queens, $2.00. Stamps accepted for single queen.

Koolairy veil, $1.50 postpaid, SAFIN queen cage, $1, for ten; 15c for one.

ALLEN LATHAM
Norwichtown, Conn.

A Good Rule to Go By

Buy your Italian bees and queens from

ALABAMA APIARIES
Mt. Pleasant, Alabama

2-lb. package with queen	$2.00
3-lb. package with queen	2.50
Queens	.65

Root QUALITY BEE SUPPLIES

Norfolk, Va.

516 Main St.

Fine Stock of Bee Supplies

Get our 1940 prices on your requirements.

Larger improved quarters with plenty of free parking space on Plume Street.

The A. I. Root Company
Phone 21750

GOOD QUEENS BY RETURN MAIL

An abundance of pollen and nectar from aster and goldenrod produce as good queens now as during the clover flow. Colonies must have queens to winter well. With a good young queen they winter better and in the spring snap into action quicker. Never too late to requeen with Hollopeter's queens. Select untested Italian queens by return mail, 50 cents each.

WHITE PINE BEE FARMS, Rockton, Pa.

CARNIOLANS CAUCASIANS

A few fine queens left of above races. Gentle, hardy, prolific, best of winterers, build up rapidly in the spring. Poor and failing queens can still be replaced. Price, 50c each; tested, $1.00 each; by airmail, 5c extra per queen.

ALBERT G. HANN, Glen Gardner, N. J.

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The Leading Bee Journal of the Southern Hemisphere is the
"Australasian Beekeeper"

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To the OMAHA NATIONAL CONFERENCE

October 22, 23, 24

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Factory hours 8 A. M. to 4:30 P. M.

Bring your beeswax with you. Take a load of supplies home. Make the freight saved pay your expenses.

Place your order now so it will be all ready for you when you call. Write for quotation on large orders.

The latch string is out! Make your headquarters with Root's.

The A. I. Root Company of Iowa, Council Bluffs, Iowa

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